Lung cancer care in Victoria

Identifying opportunities for improvement

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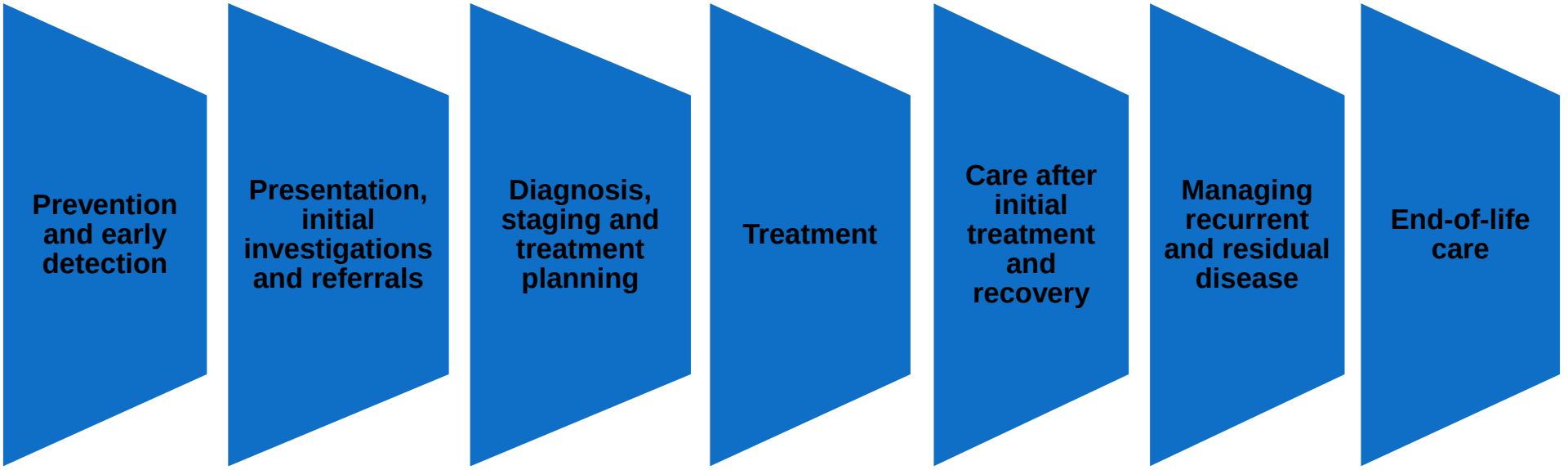
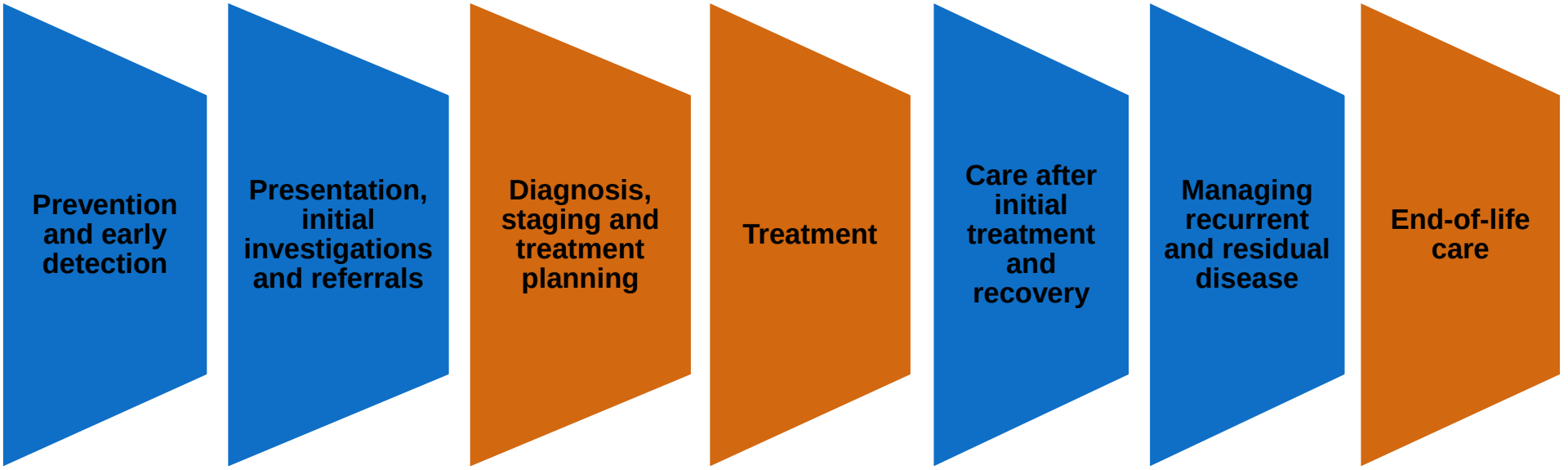
In this presentation…

- Incidence and survival
- The lung cancer population at presentation
- Care pattern and variation across Victoria
  - Diagnosis, staging & treatment planning
  - Treatment (surgery, chemotherapy &radiotherapy)
  - Supportive and palliative care

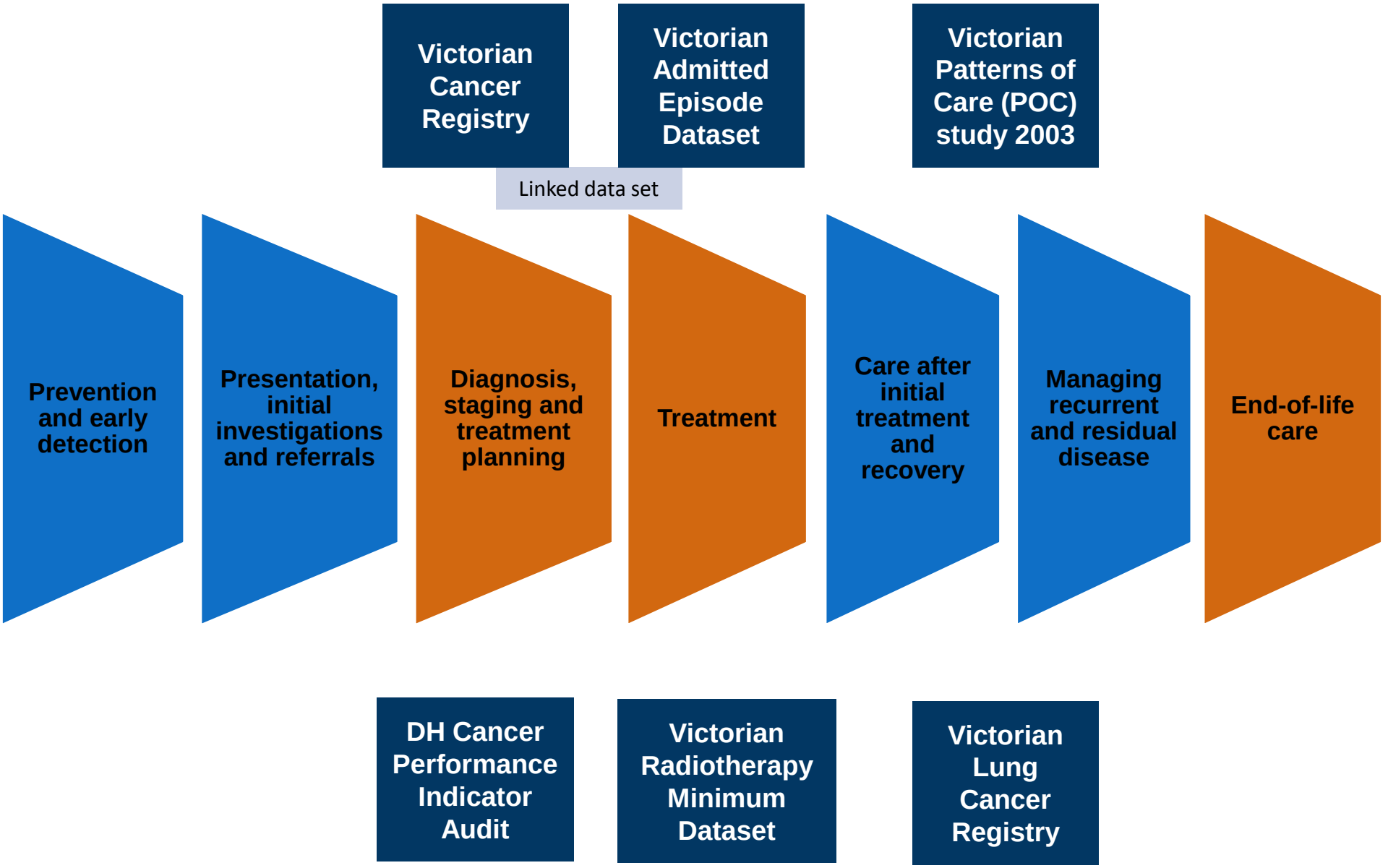
Lung cancer optimal care pathway



Lung cancer optimal care pathway



Sources of data to describe current practice



About linked data

- Links Victorian Cancer Registry with hospital activity data
- Ability to track each patient across Victorian public and private health services
- Allows identification of admitted lung cancer cases confirmed by the VCR
- Allows mapping of the patient's pathway
- Plan to include radiotherapy data

Data analysis

Limitations of the linked VCR/VAED data set:

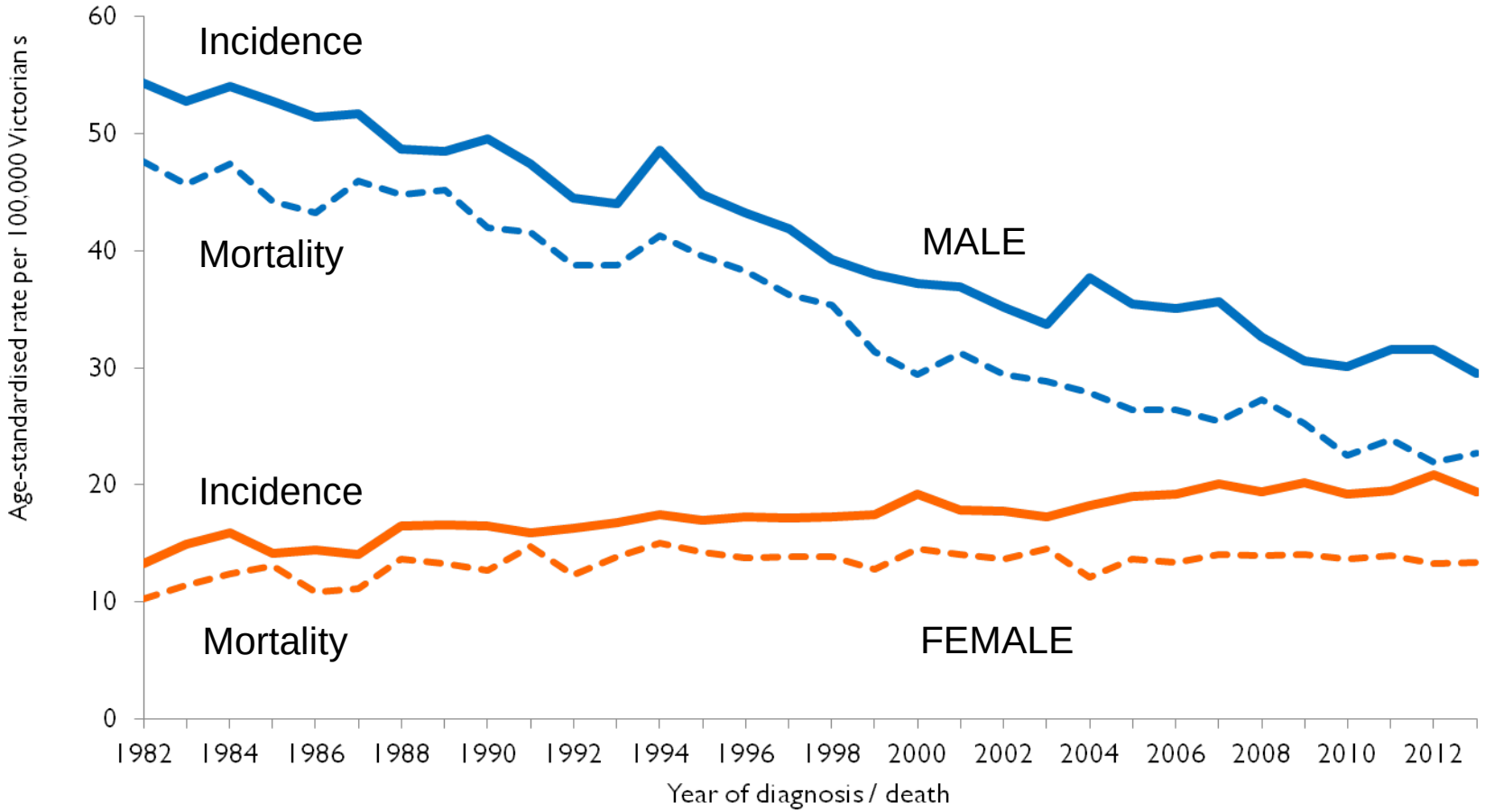
- Hume region activity data for patients treated at Albury Wodonga Health – Albury Campus is not reported to the VAED or the VCR, and was not available for analysis.

Staging is not currently available for lung cancer

Observed differences could be due to the lung patient disease characteristics such as staging

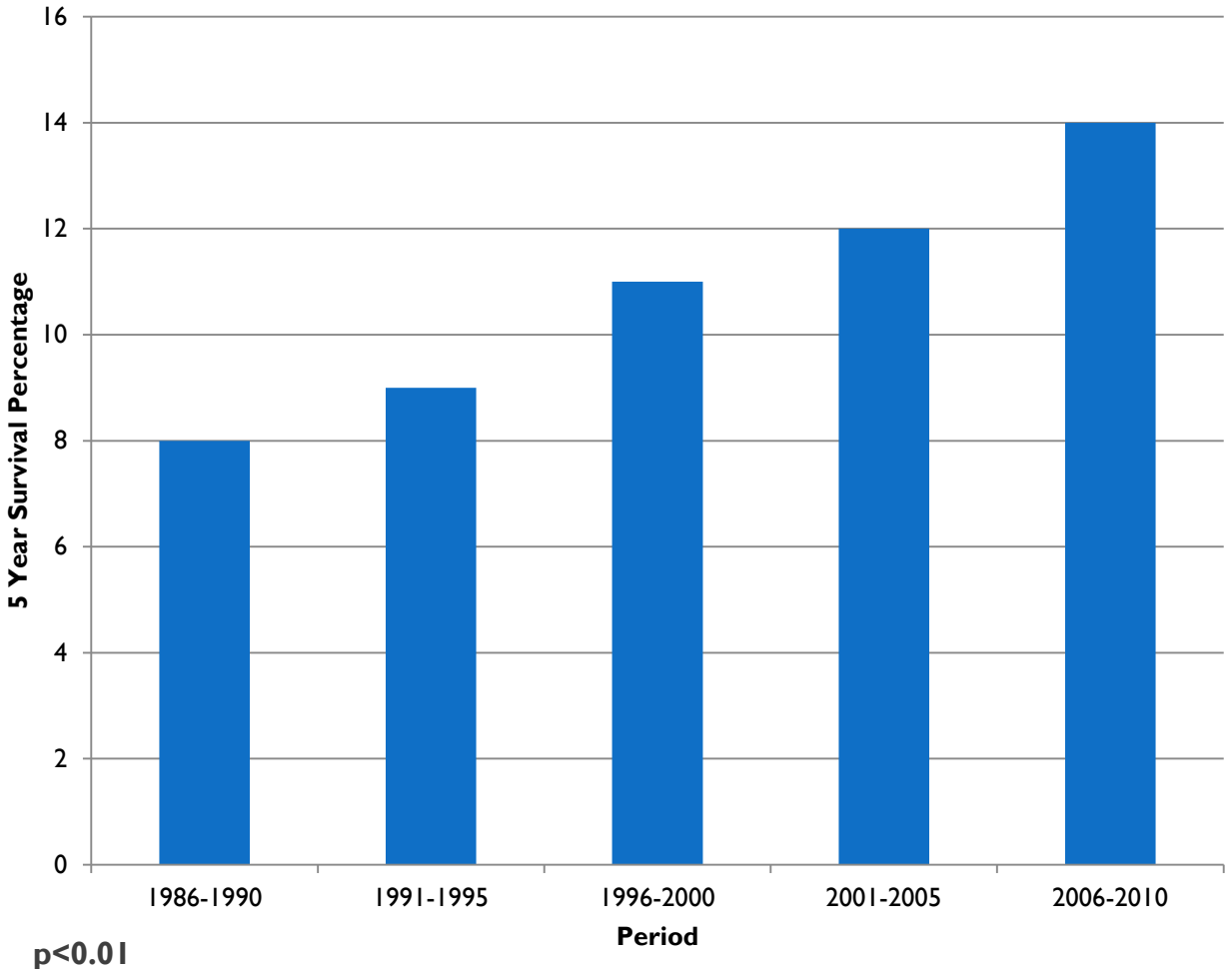
Lung cancer incidence and survival in Victoria

Trends in incidence and mortality
Victoria 1982-2012



Source: Victorian Cancer Registry (VCR) Nov 2014

Lung cancer (C33-34)
relative 5-year survival over time

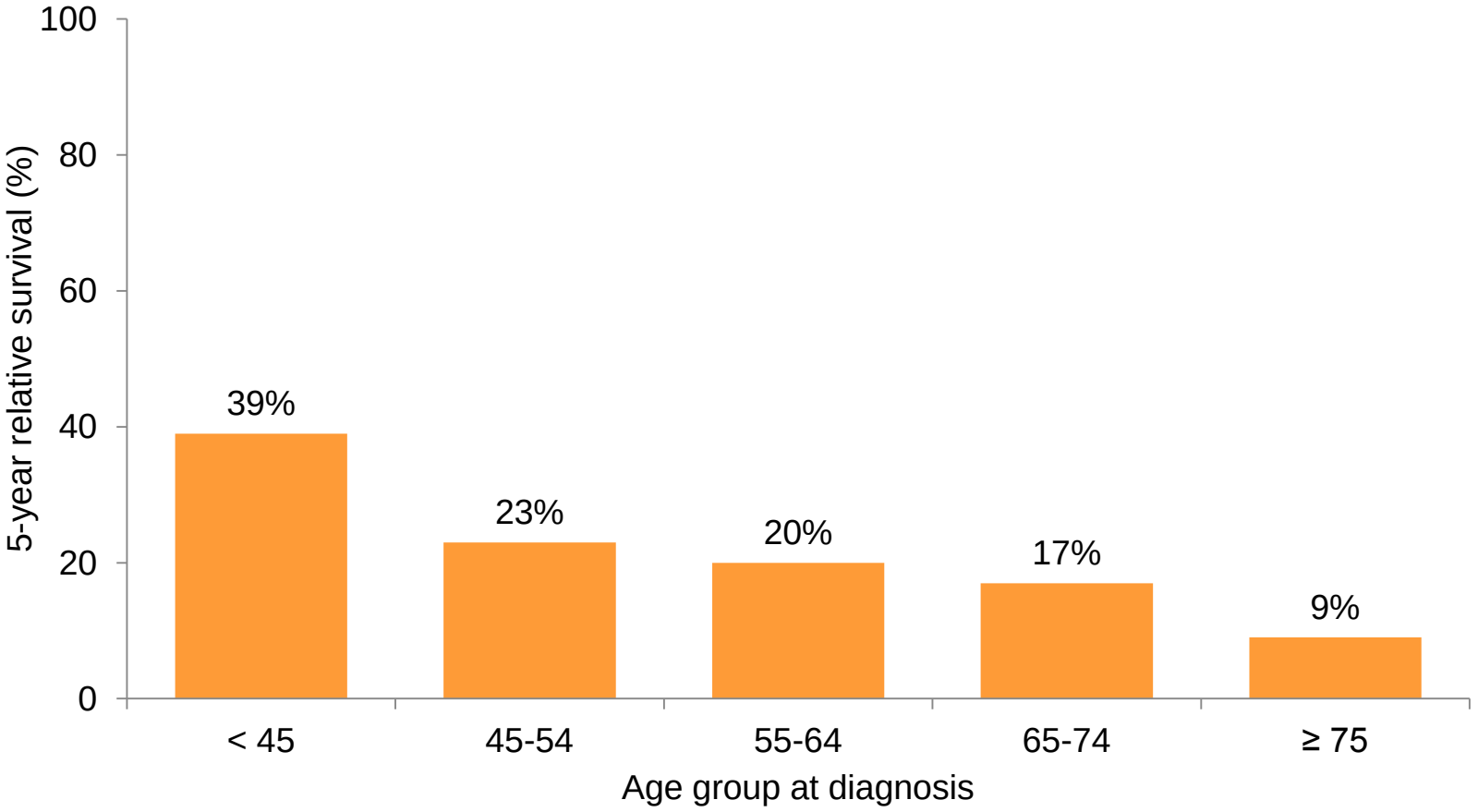


For 2008-2012 time period the 5 year survival was at 15%.

Source: VCR 2012 Cancer Survival Victoria

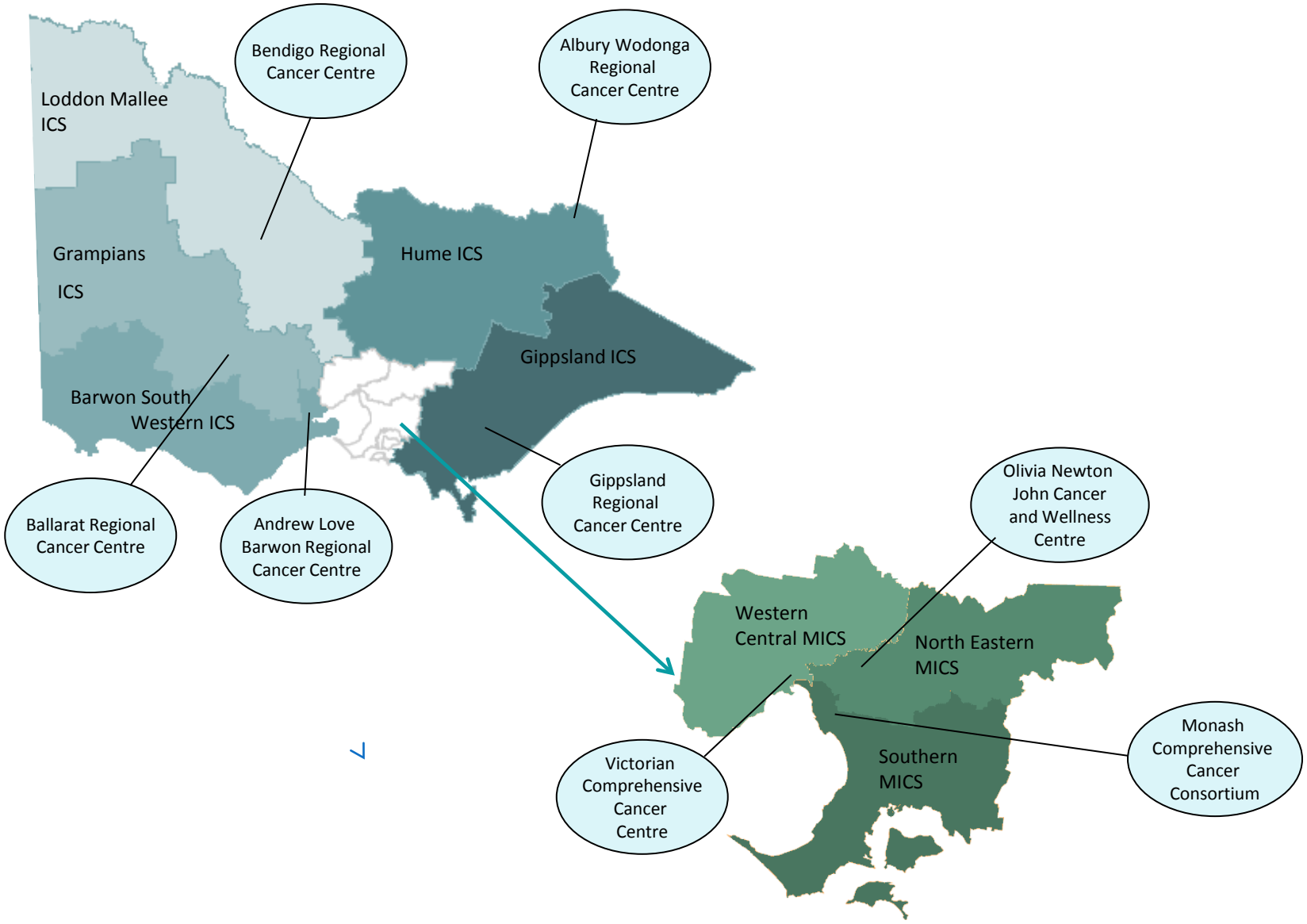
Lung cancer survival, Victoria

survival by age group, 2008-2012

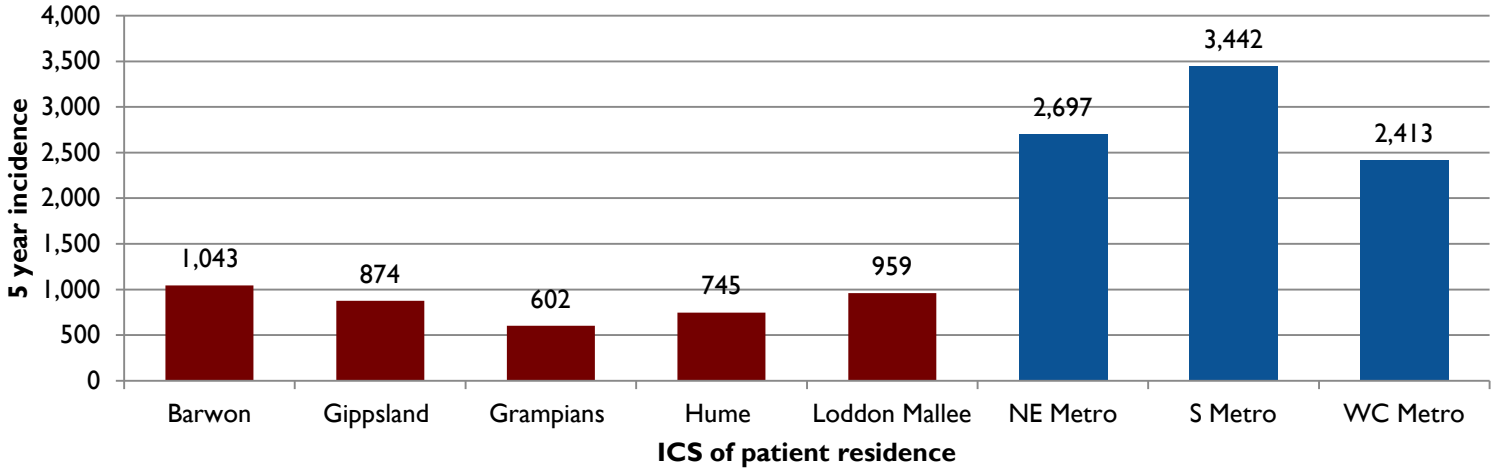


Source: Victorian Cancer Registry Nov 2014

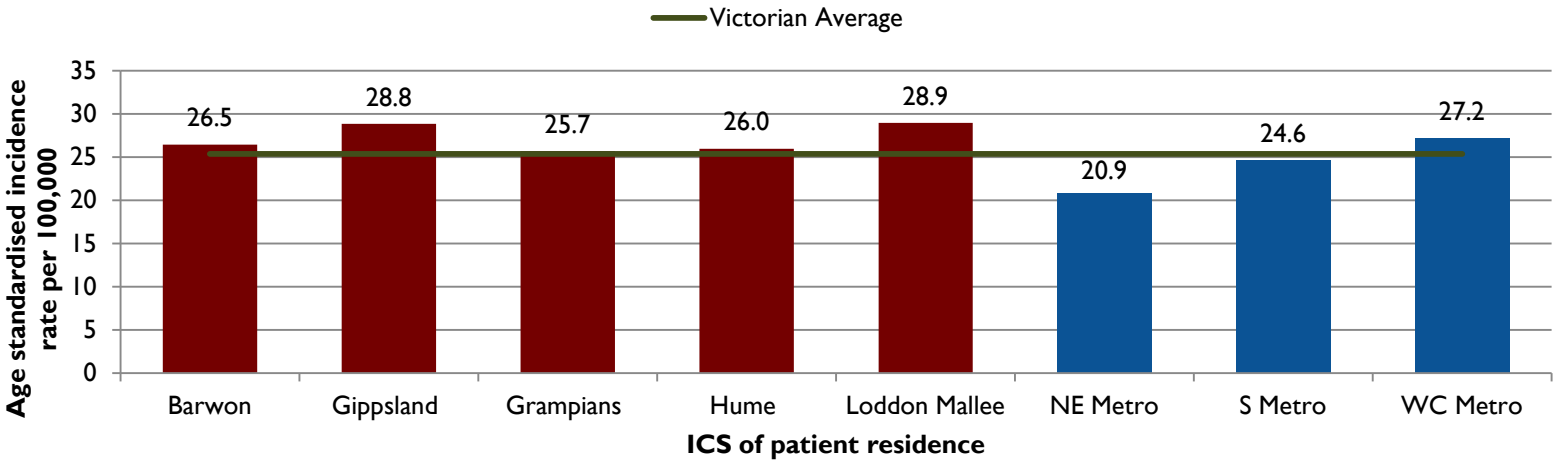
Integrated Cancer Services (ICS) & Cancer Centres



Lung cancer 5 year incidence numbers 2008-2012

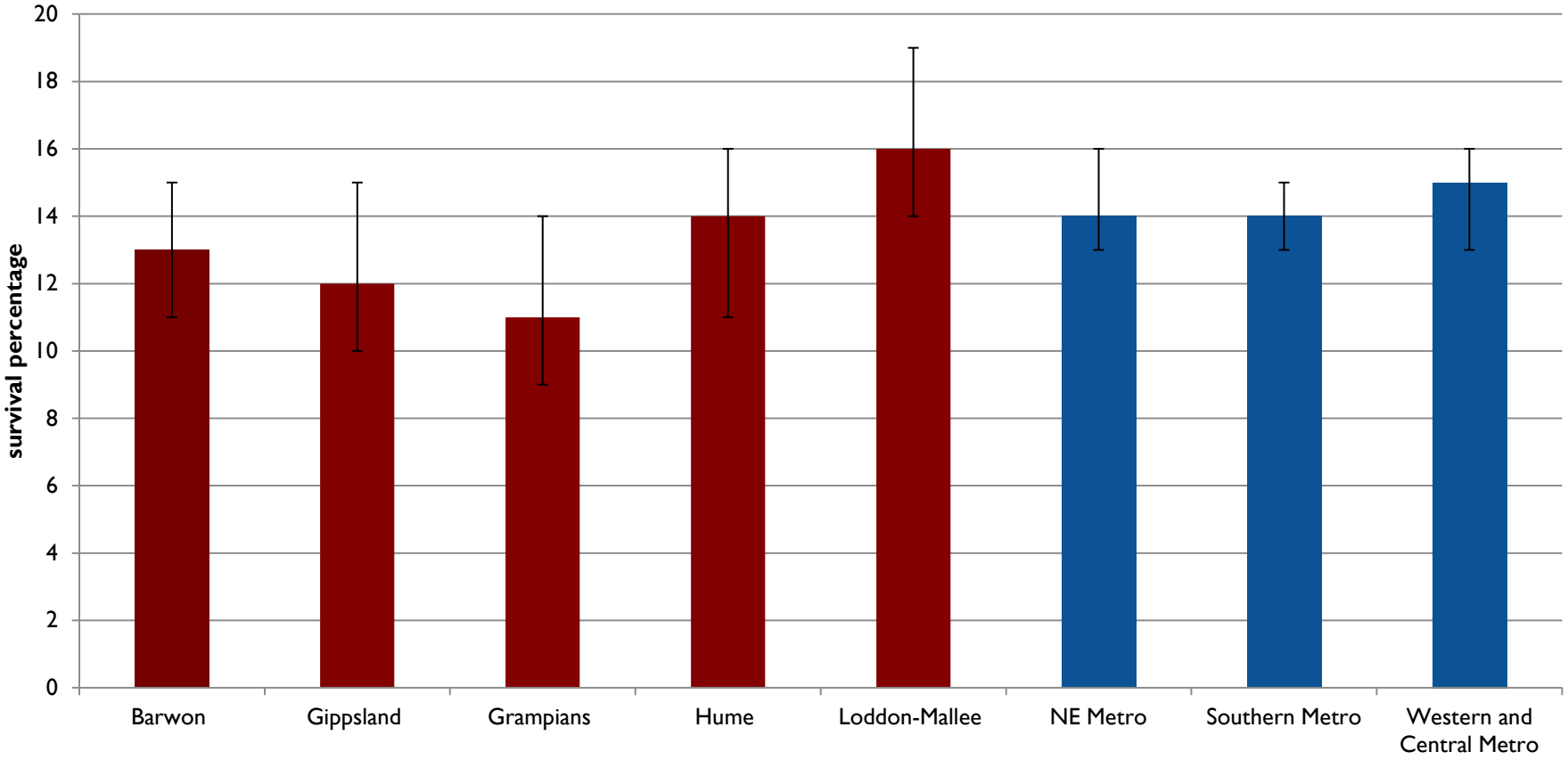


Lung cancer standardised incidence rate 2008-2012



Source: VCR 2012

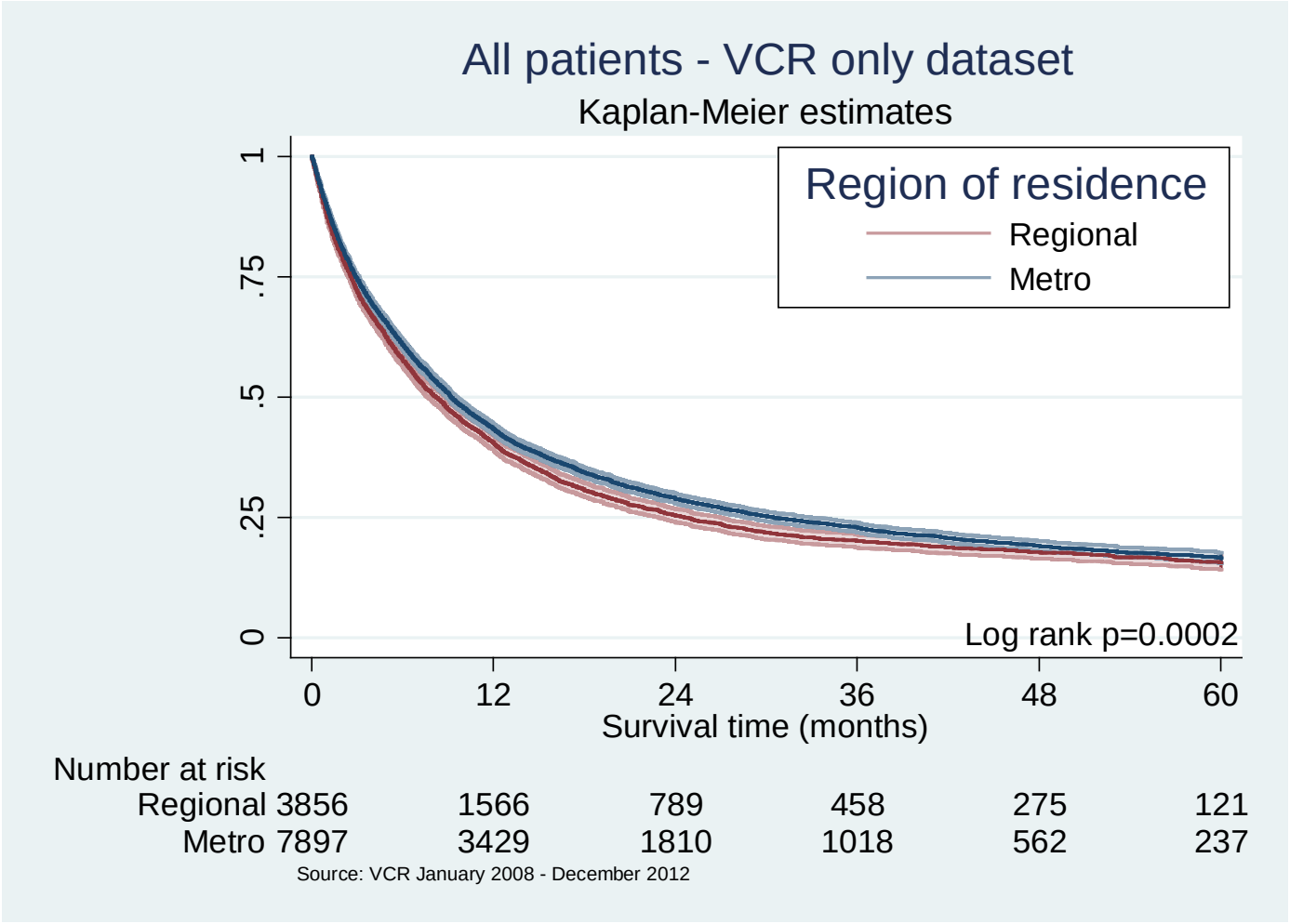
Lung cancer (C33-C34)
relative 5-year survival by ICS (2006-2010)



p= 0.35

Source: VCR Cancer Survival 2012

Lung cancer (C33-C34)
absolute survival time by region of residence



Source: VCR January 2008-December 2012

The lung cancer population at presentation

Comparison over time

	2008-2012 VCR* n= 10,234	2003 POC study n= 841
Gender male	60% (6,097)	63% (531)
Age median	71 (10-99)	72 (30-94)
No tissue diagnosis#	13% (1,328)	10% (85)
With tissue diagnosis:		
SCLC	11% (1,151)	13% (101)
NSCLC	76% (7,755)	78% (655)
Of NSCLC cases:		
Adenocarcinoma	44% (3,386)	40% (261)
Squamous cell	24% (1,840)	23% (152)
Large cell	5% (418)	13% (82)
Other / unspecified	27% (2,111)	25% (160)

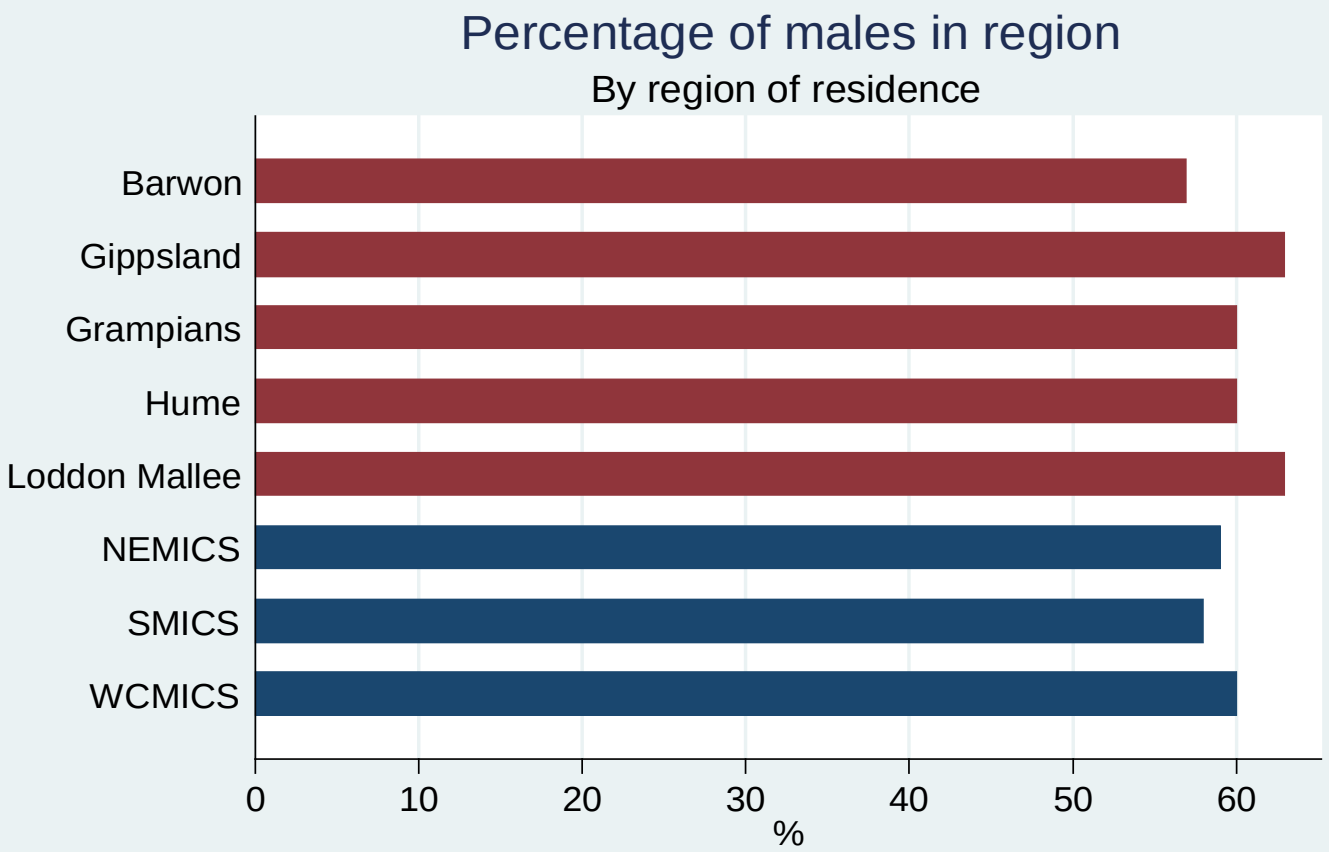
*VCR January 2008 – December 2012

#Death certificate only excluded (4%)

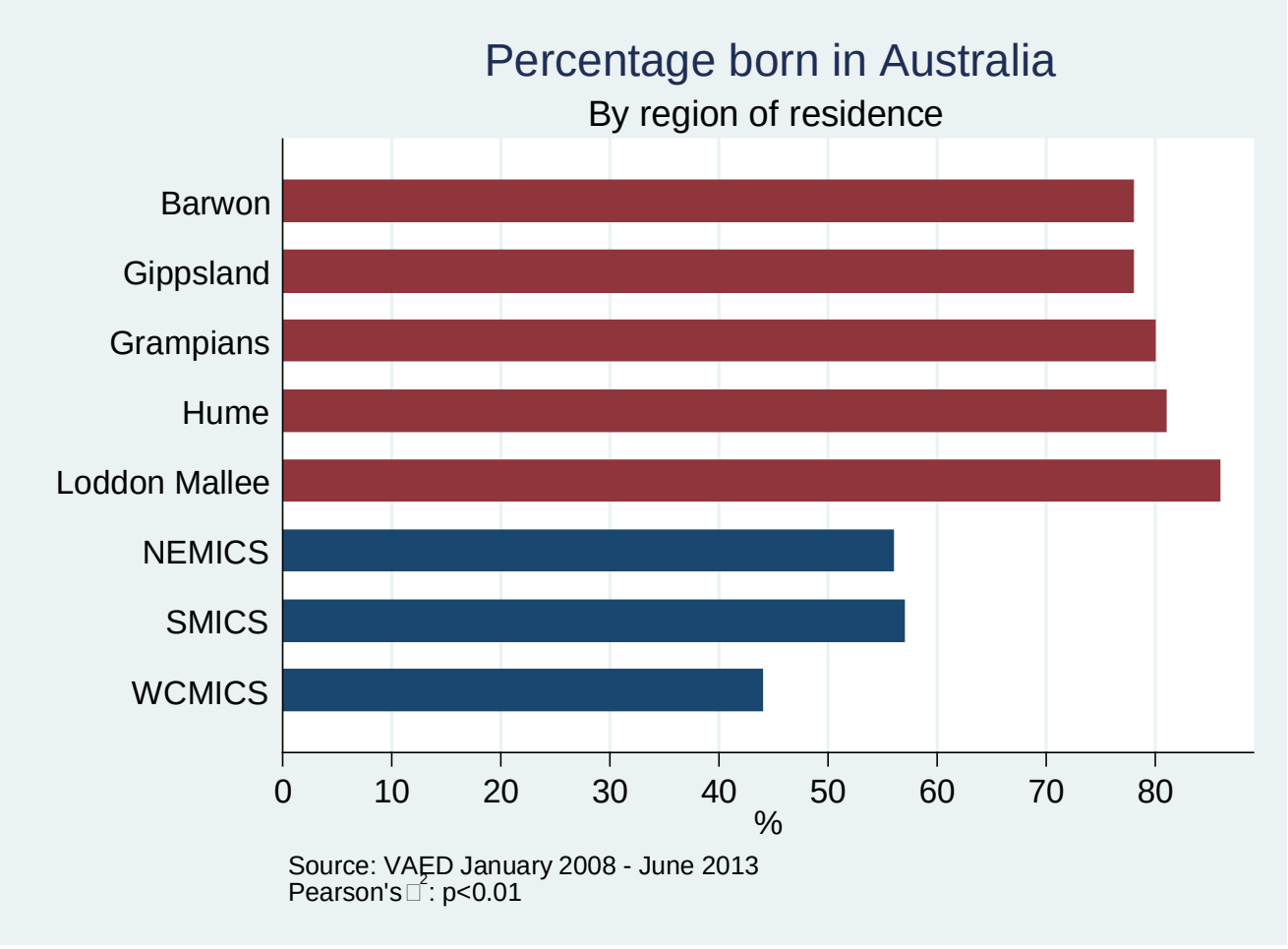
2003 POC study: smoking

- Smoking (data available for 95% cases)
  - never 63 (8%)
  - past 458 (57%)
  - current 278 (35%)
- 71% of non-smokers are female
  - Female lung cancer 4.5% non-smokers
  - Male lung cancer 3.3% non-smokers ($p<0.001$)
- Previous smokers ceased median 12 years earlier
- Tobacco exposure in smokers
  - Median 50 pack years
  - Females 37 PY vs Males 52 PY ($p<0.001$)

Lung cancer (C33-C34)
gender distribution by ICS n=10,234



Lung cancer (C33-C34)
place of birth by ICS n=10,234

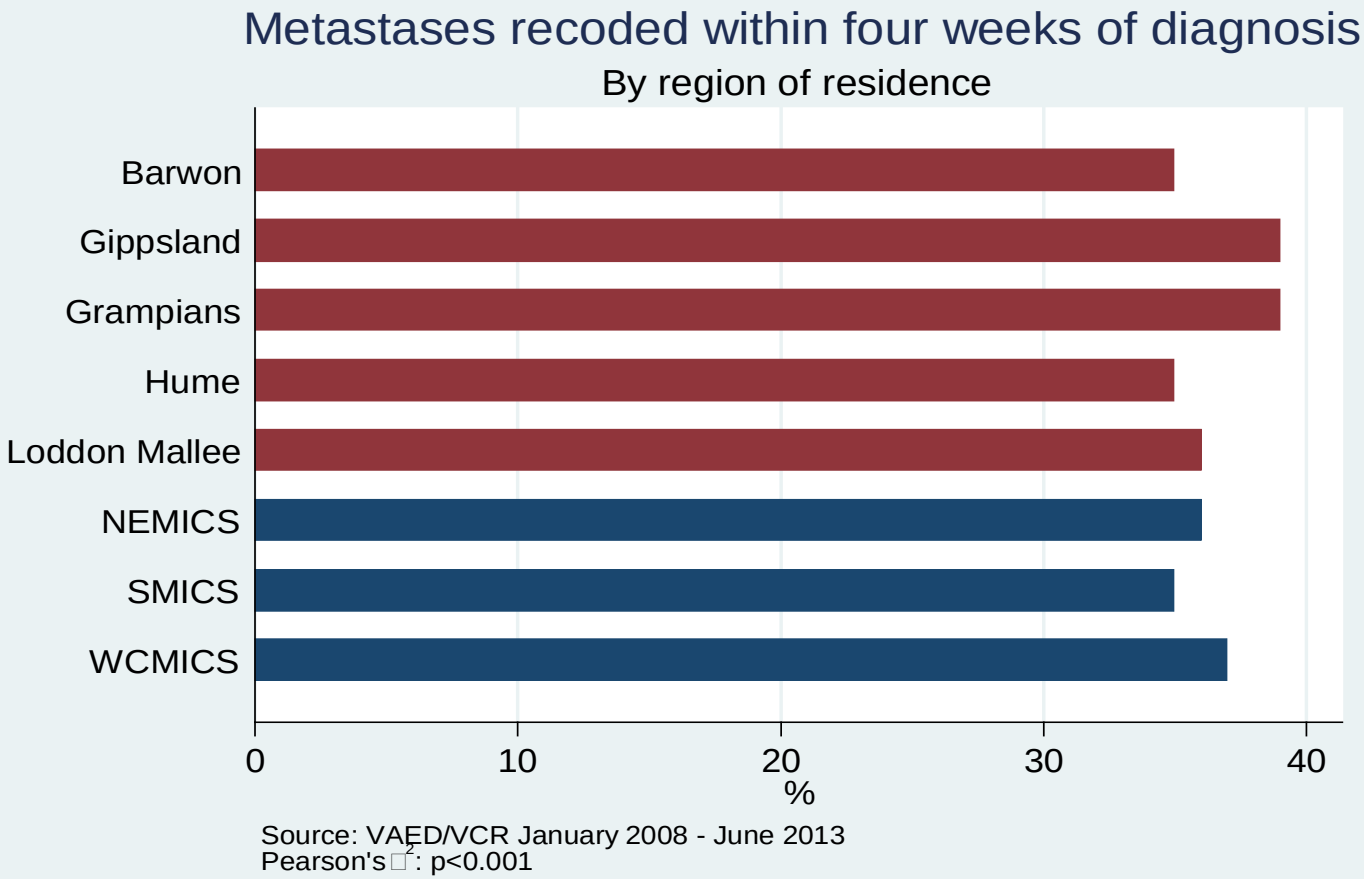


2003 POC study: stage distribution

- For NSCLC (n=602)
  - Stage I 107 (18%)
  - Stage II 30 (5%)
  - Stage III 156 (26%)
    - IIIA 71 (12%)
    - IIIB 85 (14%)
  - Stage IV 311 (52%)

Lung cancer (C33-C34)

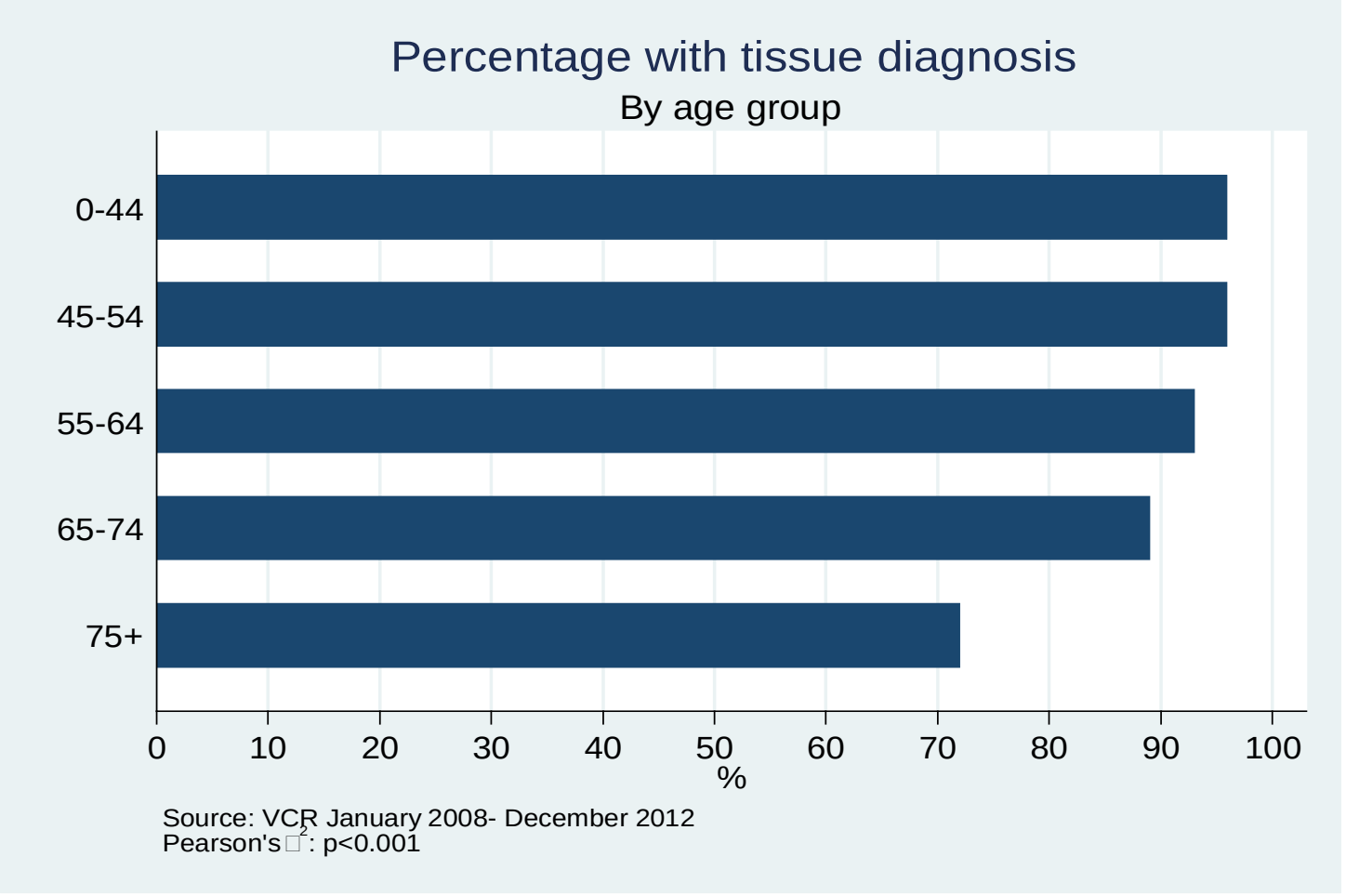
cases with coded distant metastases n=10,234



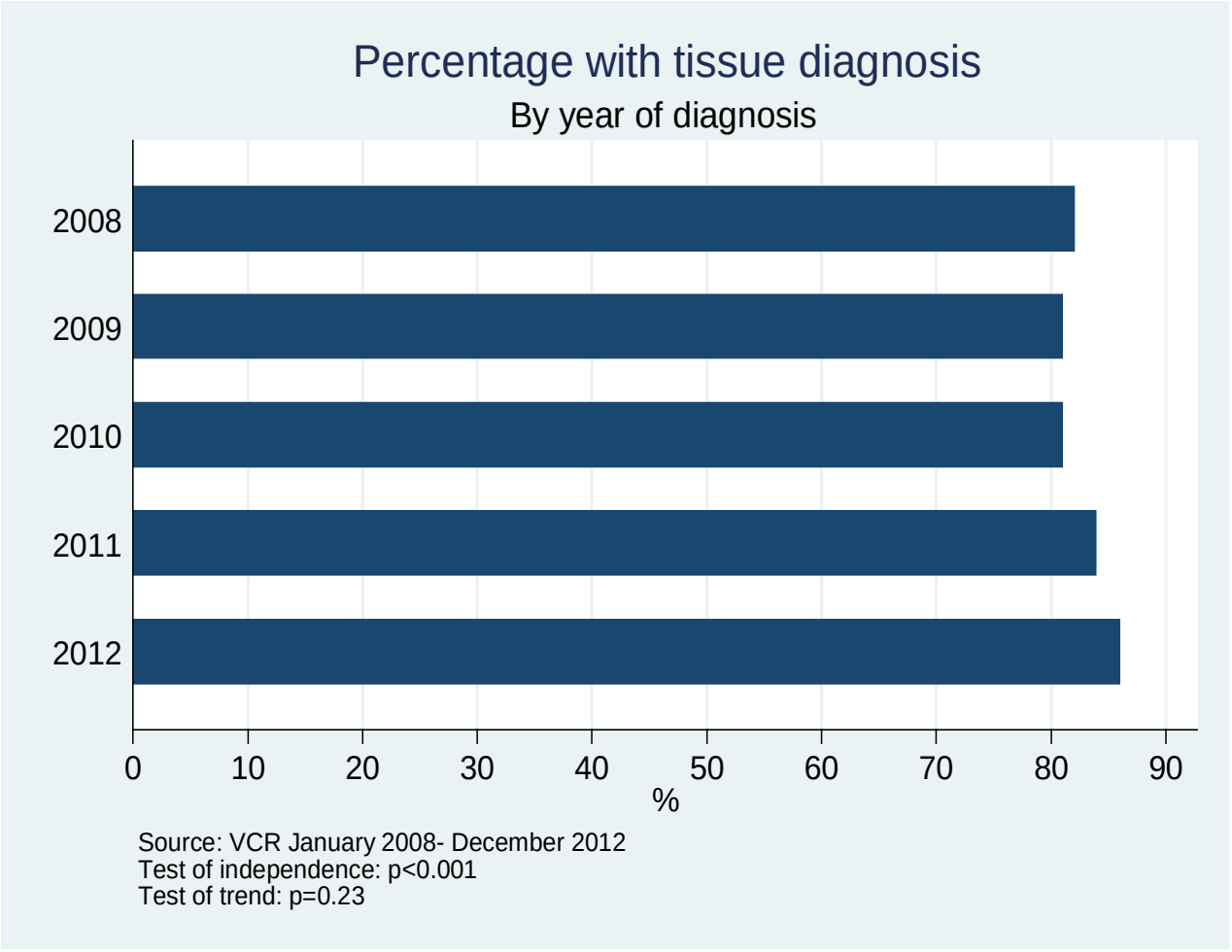
***Hume data limitation**

Tissue diagnosis

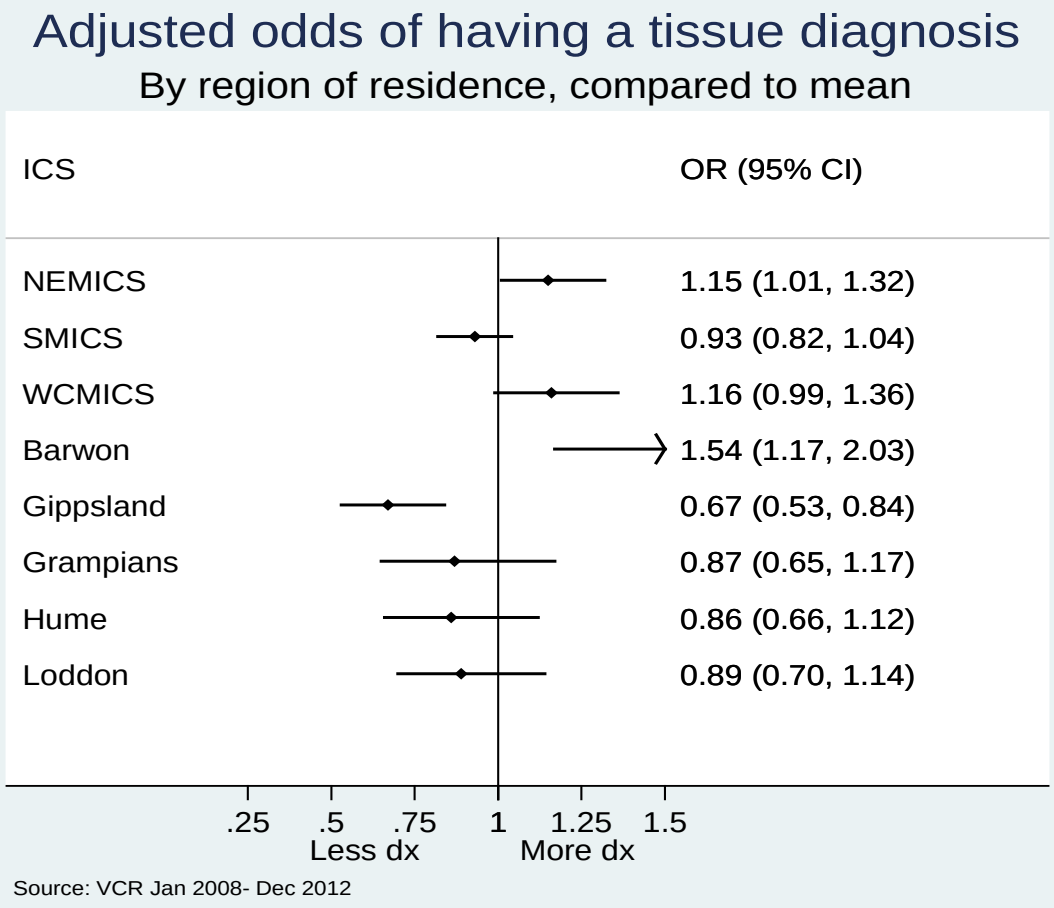
Lung cancer (C33-C34)
with tissue diagnosis by age group



Lung cancer (C33-C34)
with tissue diagnosis by year of diagnosis



Lung cancer (C33-C34)
with tissue diagnosis by ICS of residence



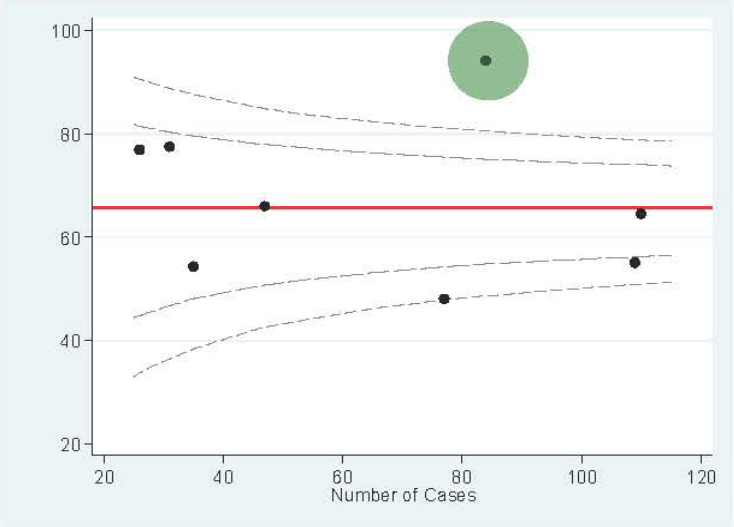
Adjusted for age, gender and country of birth
Not adjusted for stage

Timeliness of diagnosis and treatment

Process Results : Timeline - Referral to Diagnosis

QI 1: Number of patients where time from referral date to diagnosis is less than 28 days.

No.	Numerator	Denominator
1	Number of patients where time from referral date to diagnosis is less than 28 days	Total number of patients in Registry



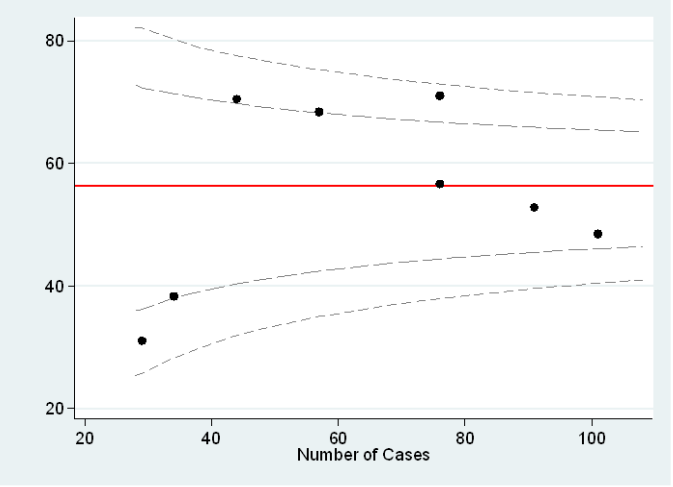
	A	B	C	D	E	F	G	H	TOTAL
Numerator	37	60	71	31	19	79	24	20	341
Denominator	77	109	110	47	35	84	31	26	519
%	48	55	65	66	54	94	77	77	66

Source: Victorian Lung Cancer Registry (VLCR) July 2012- June 2013

Process Results: Timeline – Diagnosis to first treatment

QI 2: Percentage of patients where time from diagnosis date to first treatment date is less than 14 days

No.	Numerator	Denominator
2	Number of patients where time from diagnosis date to first treatment date is less than 14 days	Total number of patients in Registry receiving treatment



	A	B	C	D	E	F	G	H	TOTAL
Numerator	43	49	48	31	39	54	13	9	286
Denominator	76	101	91	44	57	76	34	29	508
%	57	49	53	70	68	71	38	31	56

Source: VLCR July 2012- June 2013

Timeliness of diagnosis & treatment

SMICS Referral Interval Target times audit:

- A medical record audit, n = 98
- Results:
  - Diagnosis within 28 days

    71% (53) (no information - 24 cases)
  - Initiated first treatment within 14 days

    48% (39) (no information - 17 cases)

Key challenges to timely care

- No priority triage
- Delay in receiving
- Incorrect location

- EGFR testing
- Bronchoscopy
- VATS
- EBUS

Referral

Specialist

Diagnostic / staging tests

Lung MDT

Specialist

Treatment

- Inappropriate referral
- Delay EGFR testing
- Preconception re efficacy of treatment
- Preconception re curability
- Limited CDU or RT capacity
- Wait on next MDT
- Palliative delays

- Referral content
- Absent radiology
- Access
- Variation in staging
- Identification of responsible clinician
- Multiple referrals
- Accountability
- Pathology turnaround
- No palliative care

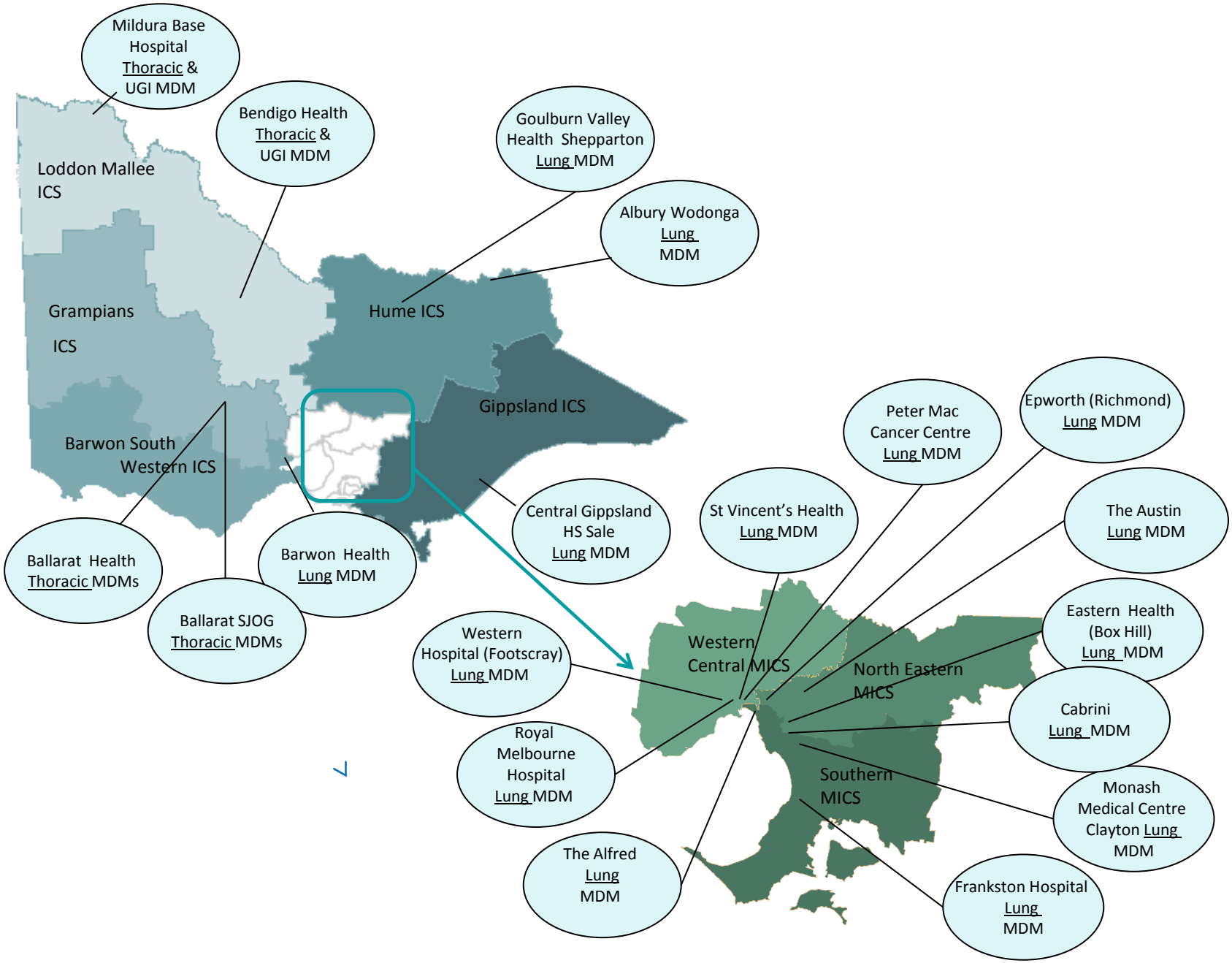
Referral to Diagnosis 28D

Diagnosis to Treatment 14D

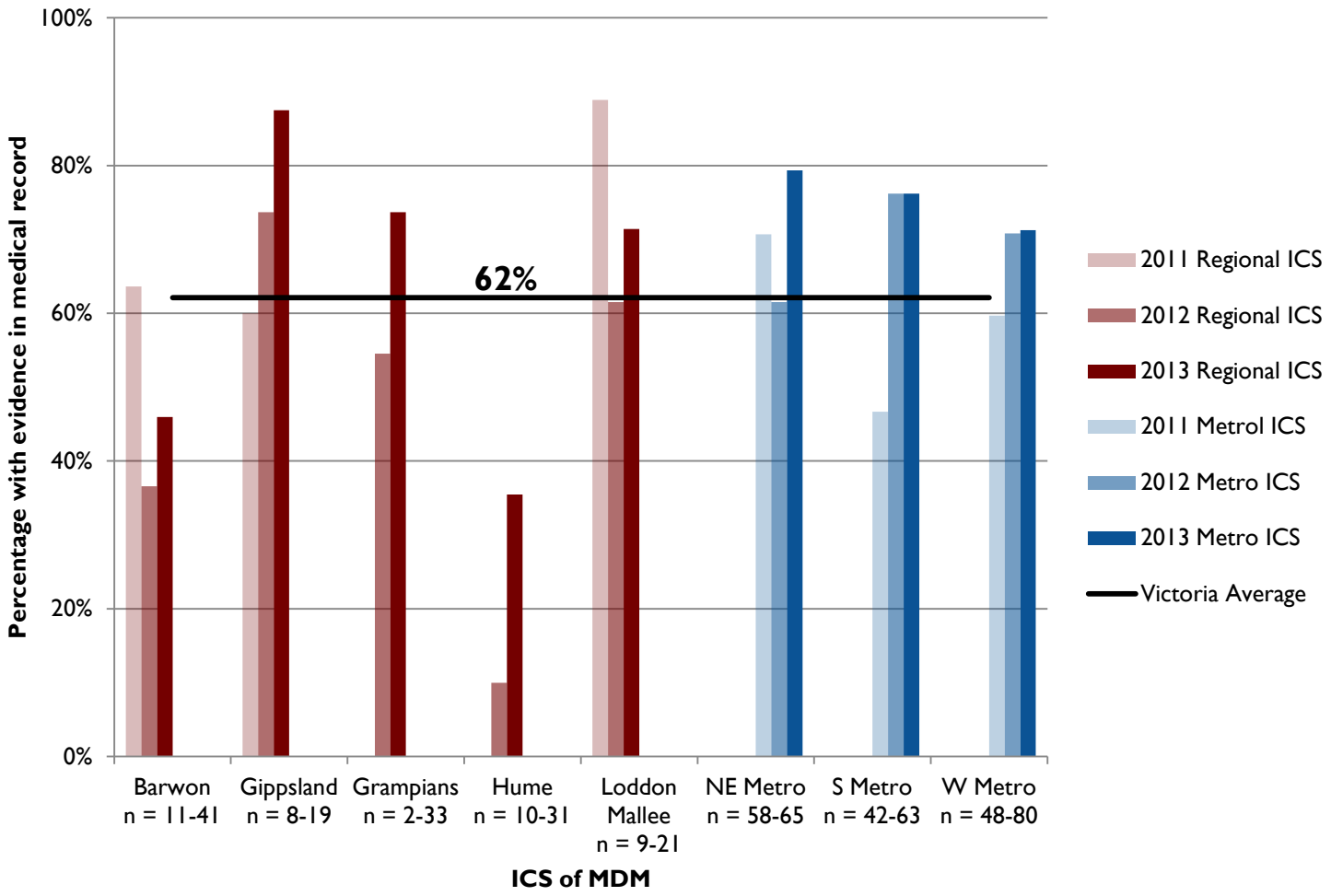
Referral to First Treatment 42D

Treatment planning: Multidisciplinary team model of care

Integrated Cancer Services (ICS) & Lung MDM Locations



Multidisciplinary treatment planning
for newly diagnosed lung patients 2011-2013



2003 POC study: MDM discussion 29%

Source: DH Audit

2003 POC study:
case discussion at MDM

- Cases discussed at MDM were more likely:
  - Younger: 69yr vs 73yr (p<0.001)
  - Treated with curative intent: 44% vs 22% (p<0.001)
  - Better PS 0-1: 69% vs 55% (p<0.001)
  - Early stage disease: 31% vs 21% (p=0.004)
  - More likely to receive treatment: 82% vs 71% (p=0.004)
- Had improved survival: 10.8 vs 5.5mths (p <0.001)

2003 POC study:
MDM discussion and patient outcomes

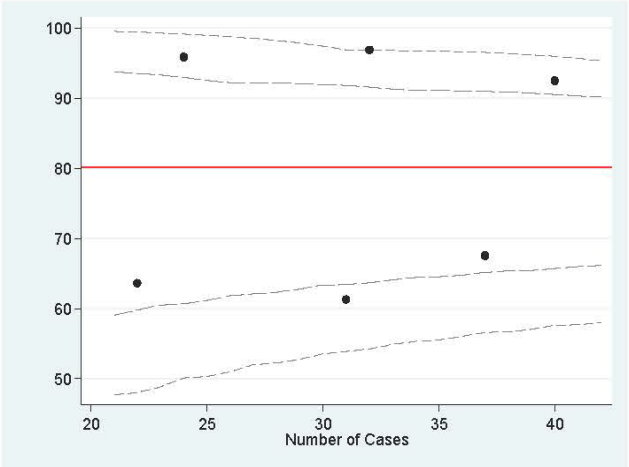
- As some patients may have died too quickly for a MDM discussion to be held, a landmark analysis was conducted for patients surviving at least 2 mths:
  - Improved survival 13.3mths vs 9.3 mths $p<0.001$
- On multivariate analysis, including all significant variables, MDM discussion an independent prognostic factor for survival:
  - For all lung cancer $p=0.008$
  - For NSCLC $p=0.005$

Staging

Process Results : PET documented prior to resection

QI 9: Number of patients with clearly documented PET at diagnosis undergoing curative resection.

No.	Numerator	Denominator
9	Number of patients with clearly documented PET at diagnosis undergoing curative resection	Total number of patients undergoing curative resection



2003 POC study

Before curative:
- surgery 78%
- radiotherapy 84%

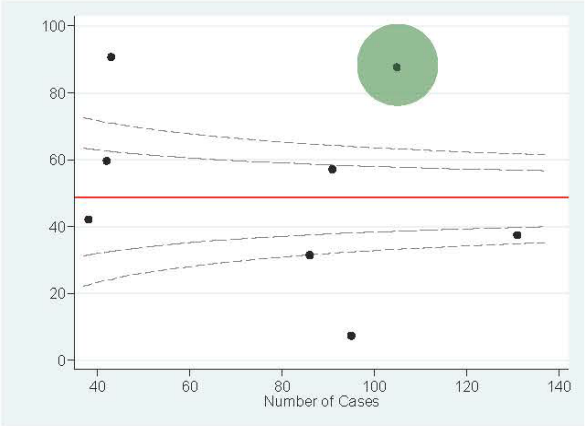
	A	B	C	D	E	F	G	H	TOTAL
Numerator	31	25	37	23	19	14	3	2	154
Denominator	32	36	39	24	31	22	5	2	191
%	97	69	95	96	61	64	60	100	81

Source: VLCR July 2012- June 2013

Process Results: clinical TNM staging

QI 7: Number of patients with clearly documented cTNM at diagnosis.

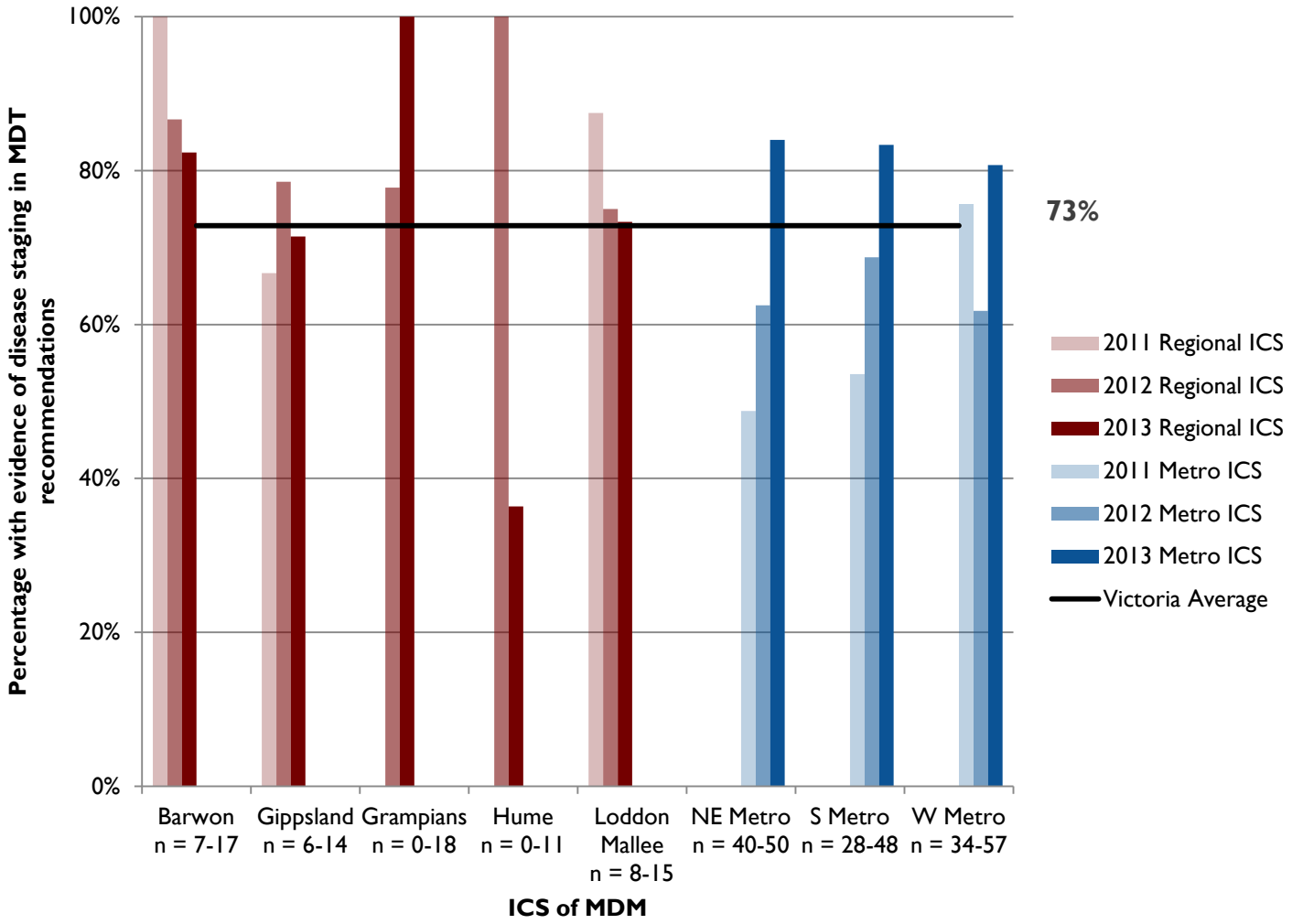
No.	Numerator	Denominator
7	Number of patients with clearly documented cTNM at diagnosis	Number of patients with NSCLC



	A	B	C	D	E	F	G	H	TOTAL
Numerator	52	49	92	39	7	27	25	16	307
Denominator	91	131	105	43	95	86	42	38	631
%	57	37	88	91	7	31	60	42	49

Source: VLCR July 2012- June 2013

Staging in MDM documentation for cases discussed at MDM (2011-2013)



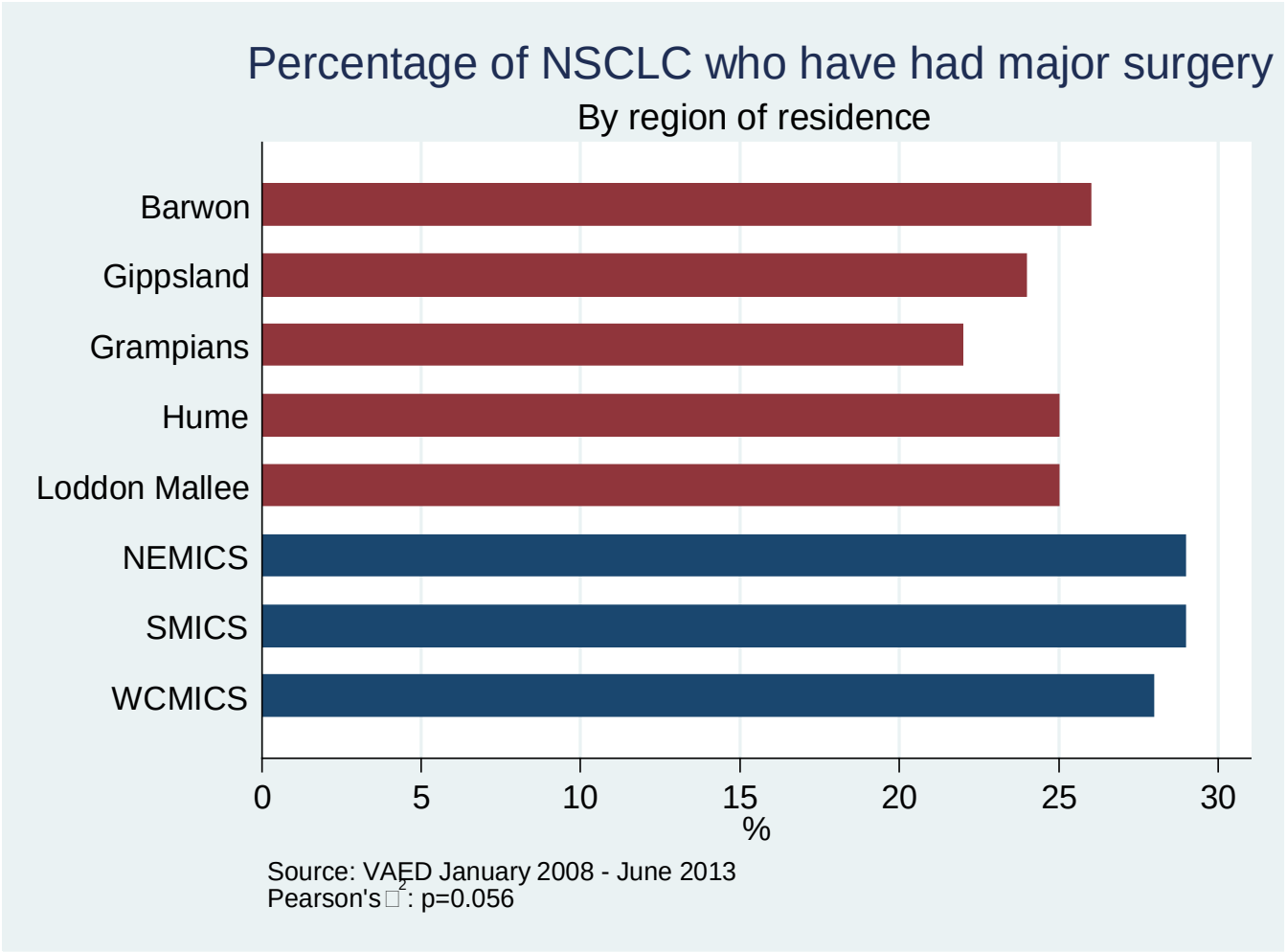
Source: DH audit
Sampling from VCR

Treatment: Surgery in NSCLC

Major lung surgery from VAED

- Pneumonectomy
- Lobectomy of lung
- Partial resection of lung
- Other excision procedures on lung or pleura

Major lung cancer surgery
in NSCLC by ICS of residence n= 2,035

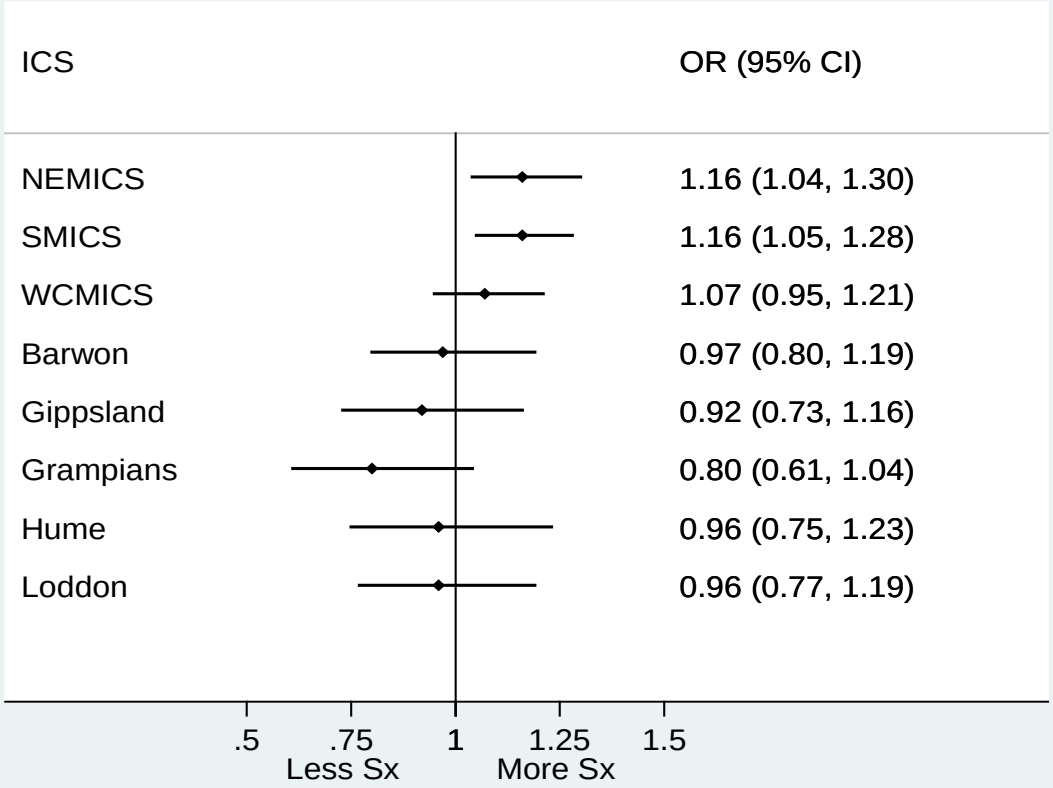


*Hume data limitation

Major lung cancer surgery in NSCLC by ICS of residence n= 2,035

Adjusted odds of having major surgery for NSCLC

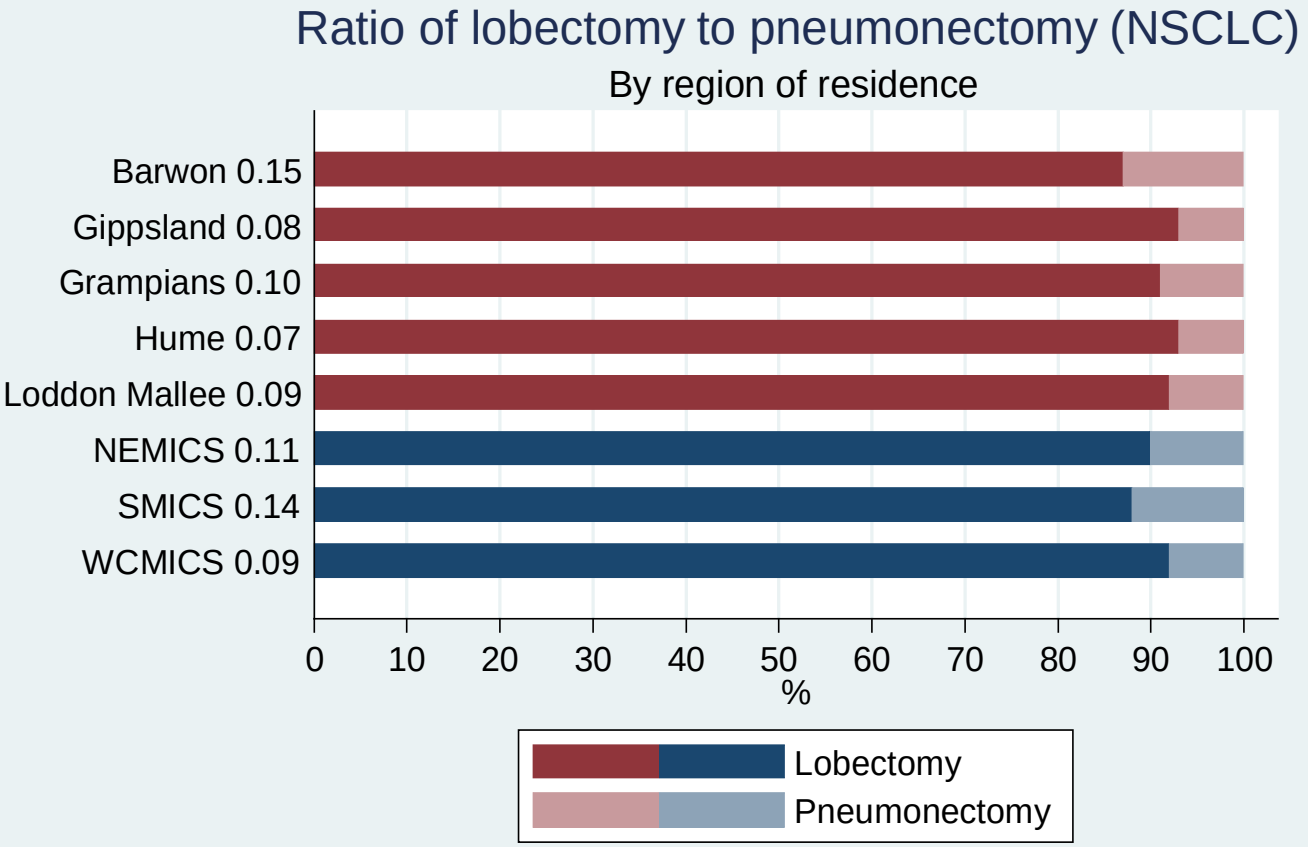
By region of residence, compared to mean



Source: VAED January 2008 - June 2013

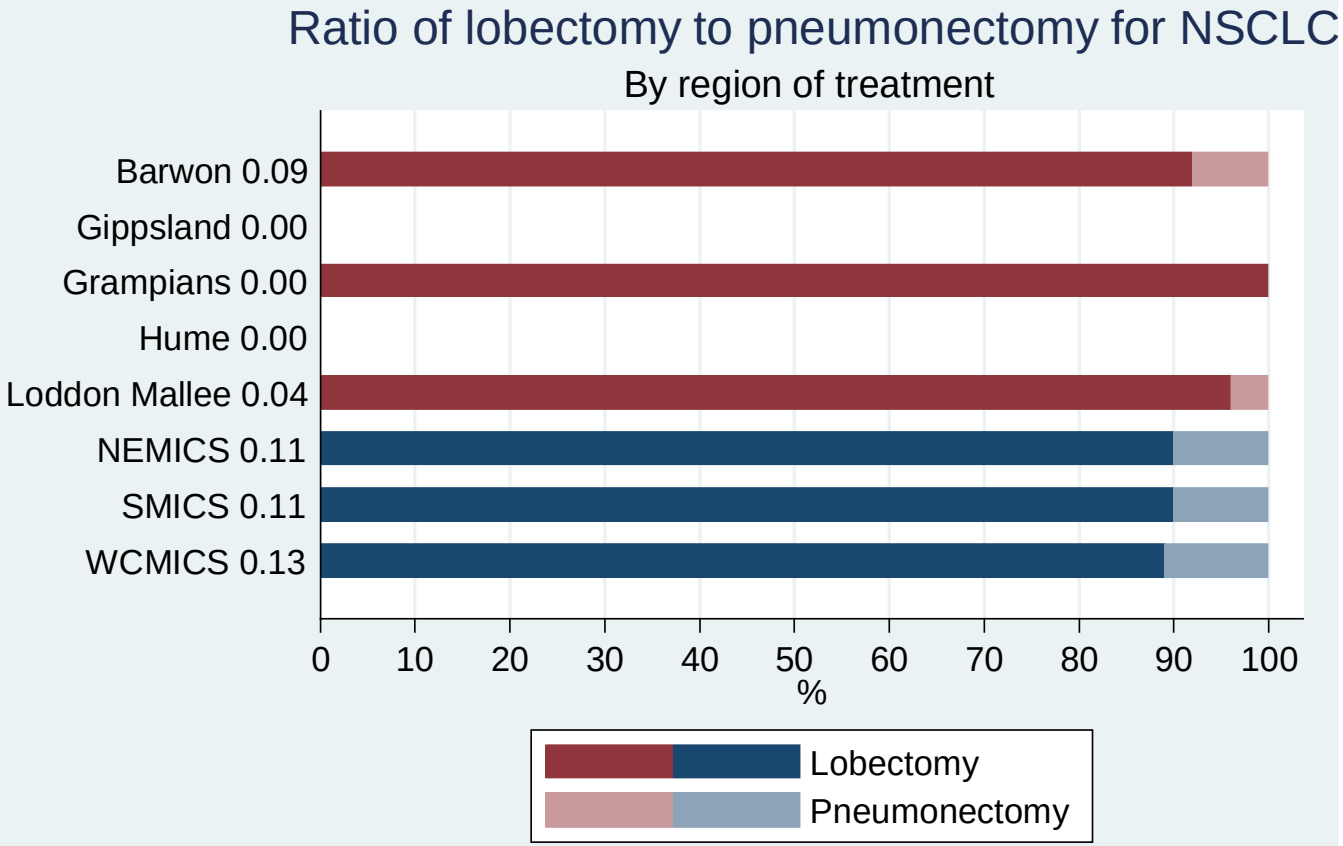
Adjusted for age, gender and country of birth
Not adjusted for stage

Ratio of NSCLC lobectomy: pneumonectomy
by ICS of residence n=1277



*Hume data limitation

Ratio of NSCLC lobectomy: pneumonectomy in by ICS of treatment n=1277

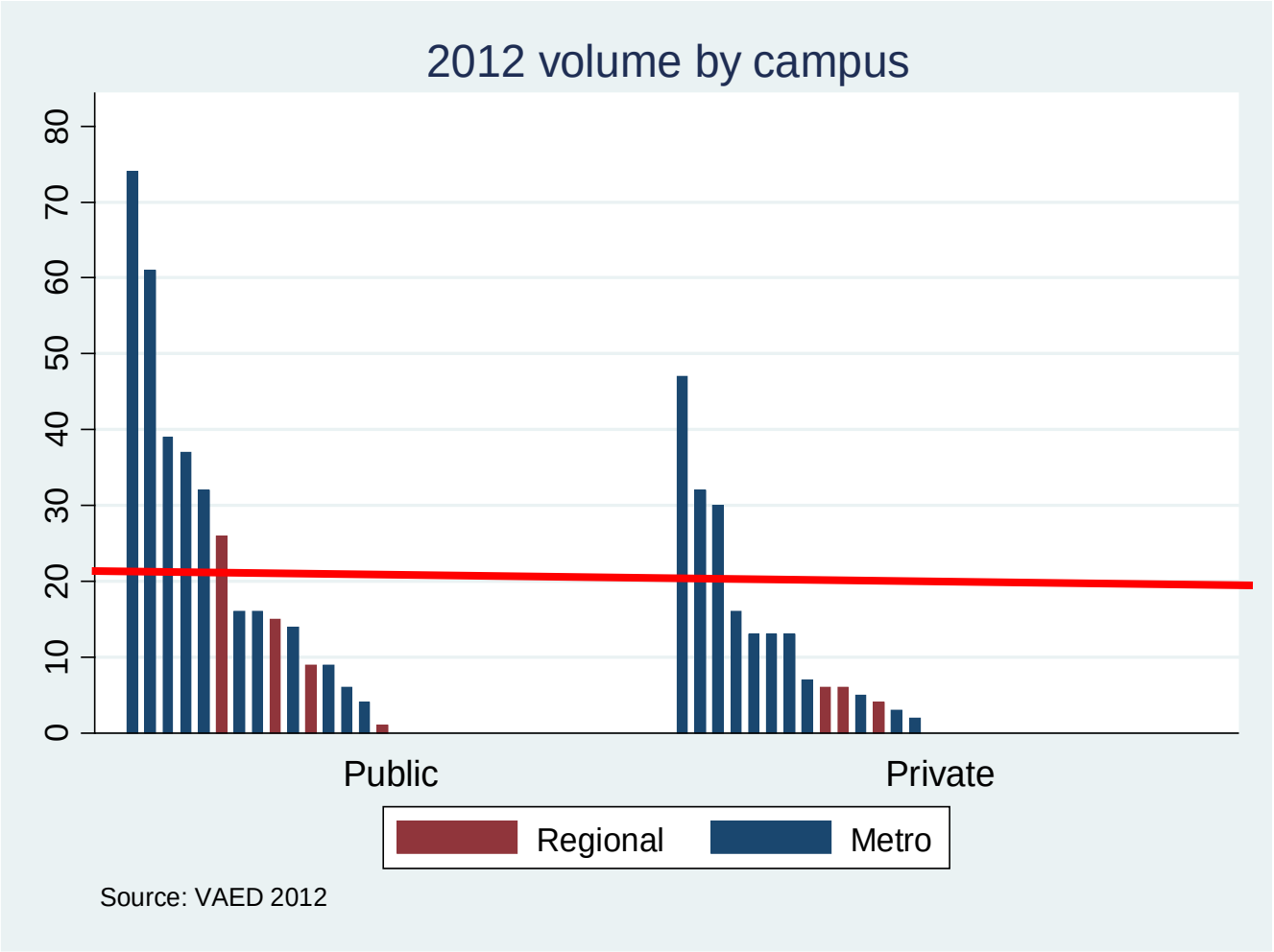


*Hume data limitation

Lung cancer major surgery:
ICS of treatment by ICS of residence

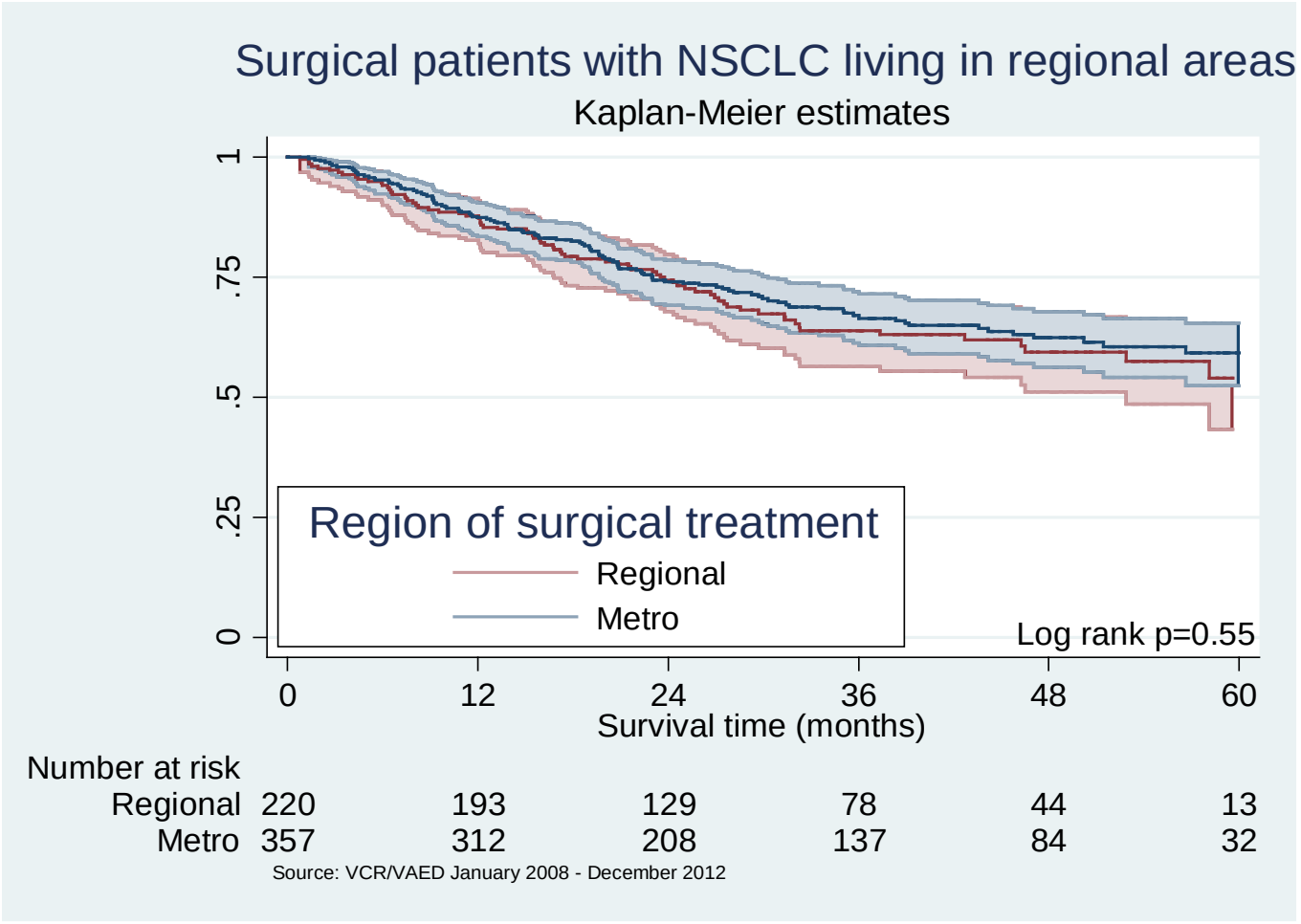
ICS of treatment	ICS of residence at first admission									Total (n=2153)
	NEMICS (n=416)	SMICS (n=484)	WCMICS (n=347)	Barwon (n=131)	Gippsland (n=98)	Grampians (n=69)	Hume (n=92)	Loddon (n=117)	Interstate (n=399)	
NEMICS	270	17	77	4	11	1	18	13	98	**509**
SMICS	47	406	13	2	31	5	3	4	110	**621**
WCMICS	99	61	253	43	55	16	70	36	151	**784**
Barwon			3	81	1	2			15	**102**
Gippsland										**0**
Grampians				1		44		5	9	**59**
Hume										**0**
Loddon						1	1	59	16	**77**
PICS			1							**1**

Lung cancer major surgery: annual volume by health service



For partial resection, lobectomy & pneumonectomy procedures

Surgical NSCLC patient survival time
by regional vs metro



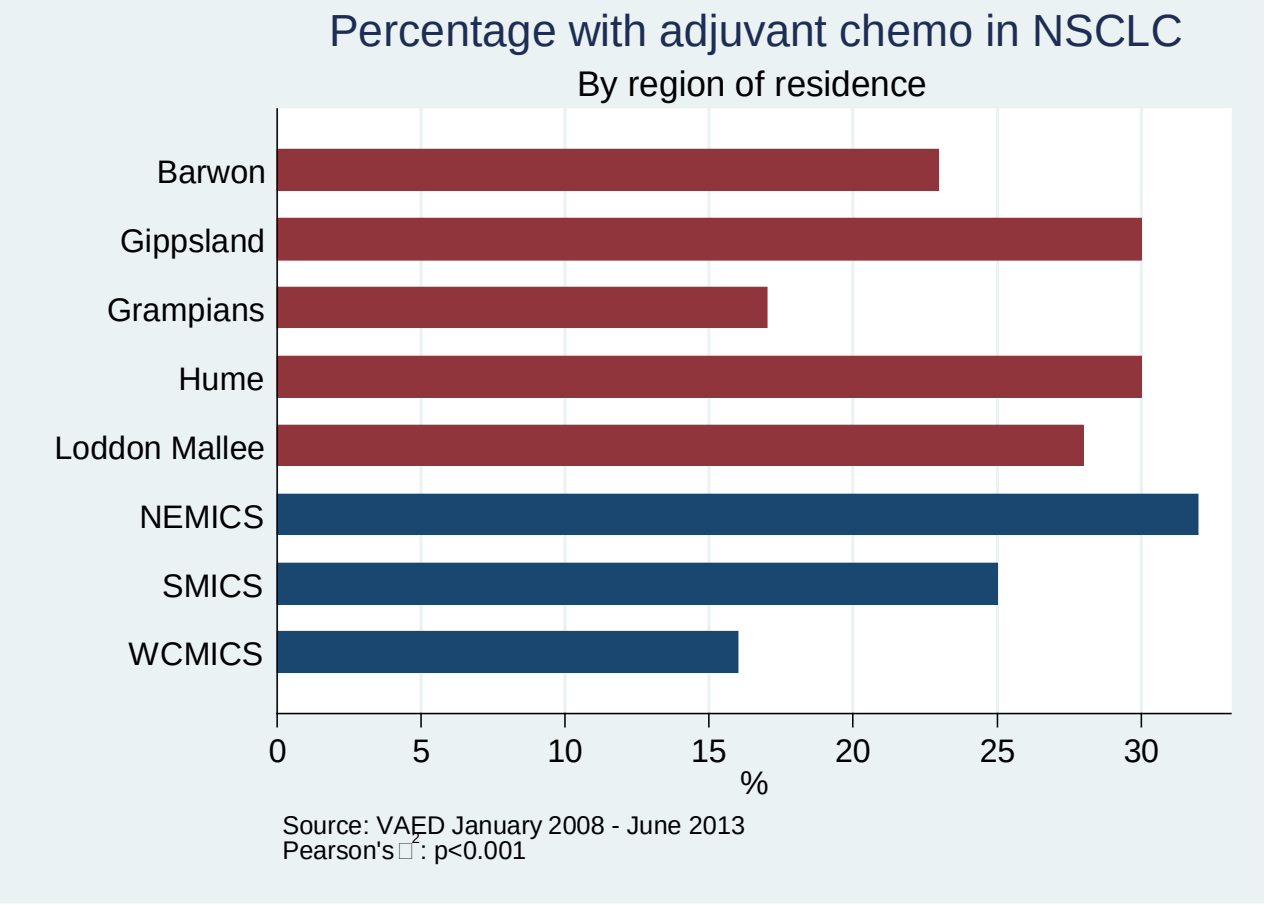
30 day mortality following major lung surgery in NSCLC

ICS	By ICS of residence n=1 615, p= 0.84	By ICS of treatment n=2 035, p=0.3
Barwon	4% (5)	5% (6)
Gippsland	1% (1)	0
Grampians	3% (3)	5% (3)
Hume	1% (1)	1% (4)
Loddon-Malle	2% (2)	0
NEMICS	2% (9)	2% (10)
SMICS	2% (9)	3% (16)
WCMICS	3% (9)	2% (14)

Source: VCR/VAED January 2008-December 2012

Chemotherapy in NSCLC

Chemotherapy within 90 days of major lung surgery n=2035



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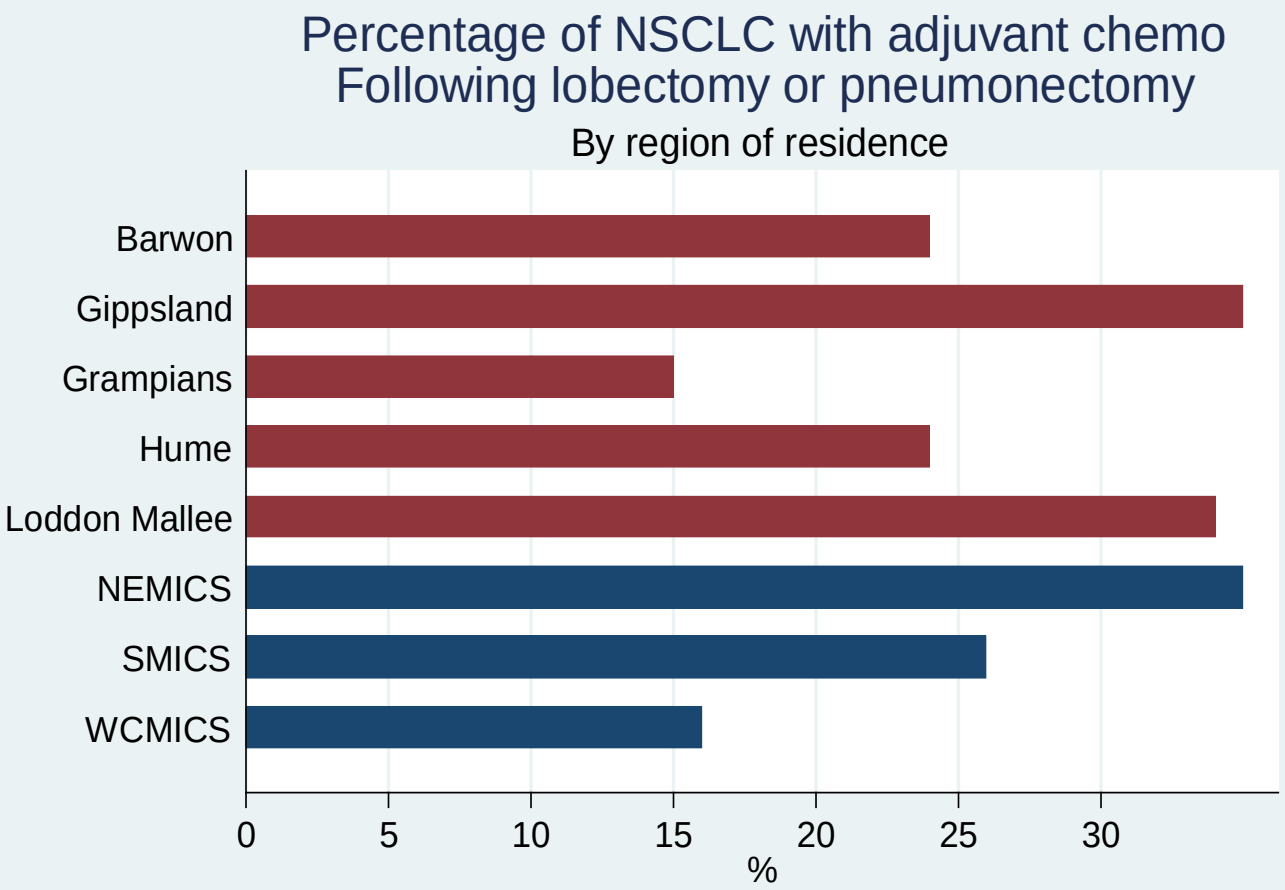
Chemotherapy within 90 days of lobectomy / pneumonectomy n=1277



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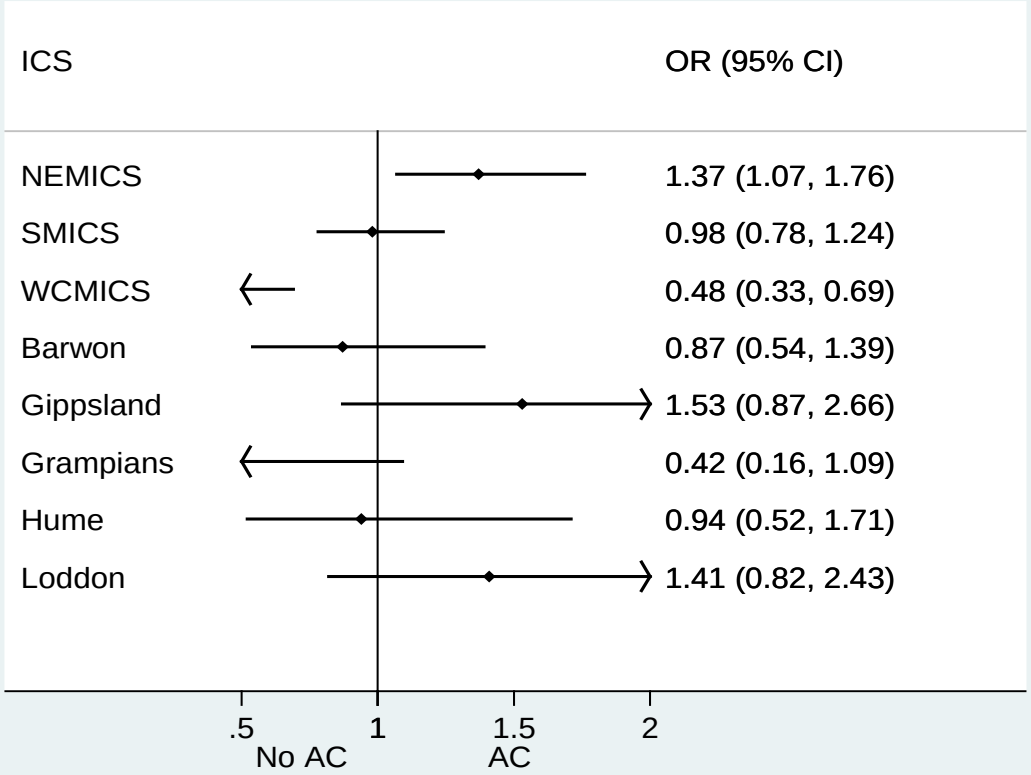
Chemotherapy within 90 days of surgery

Adjuvant chemo post lobectomy/pneumonectomy

By region of residence, compared to mean



Source: VAED January 2008 - June 2013

Adjusted for age, gender and country of birth
Not adjusted for stage

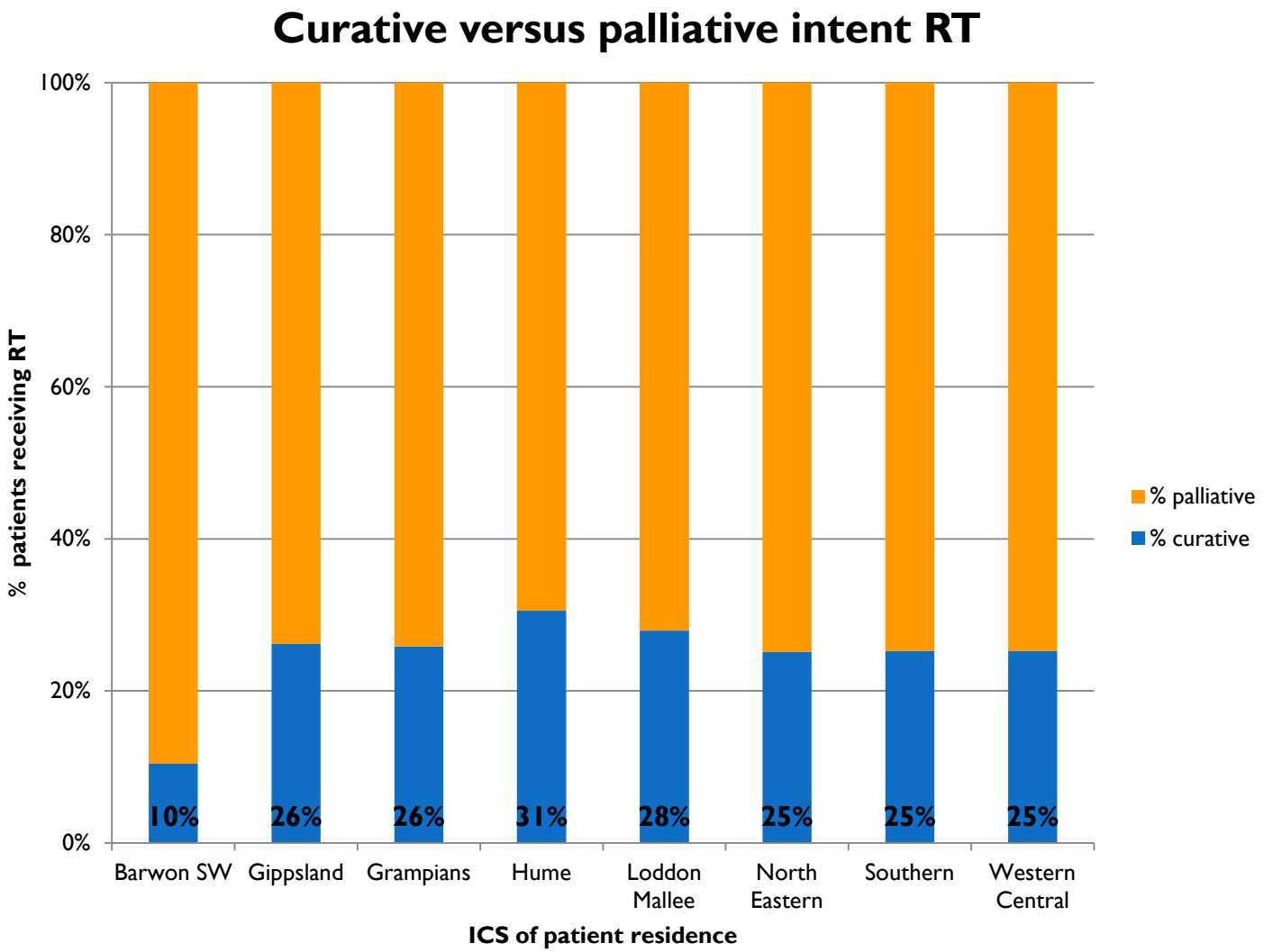
Radiotherapy utilisation for lung cancer

Utilisation rates by ICS of residence for lung cancer in 2012

	2012	
	Percentage of incidence	Number of cases receiving RT
S Metro	50%	718
NE Metro	48%	581
WC Metro	51%	499
Metro total	49%	1798
Barwon	45%	226
Gippsland	55%	174
Grampians	34%	131
Hume	40%	141
Loddon Mallee	50%	213
Regional total	46%	885
Victorian total	**48%**	**2683**

Source: Victorian Radiotherapy Minimum Dataset (VRMDS) ***CCORE estimate for lung cancer – 77%***

Curative intent RT in Lung cancer 2012



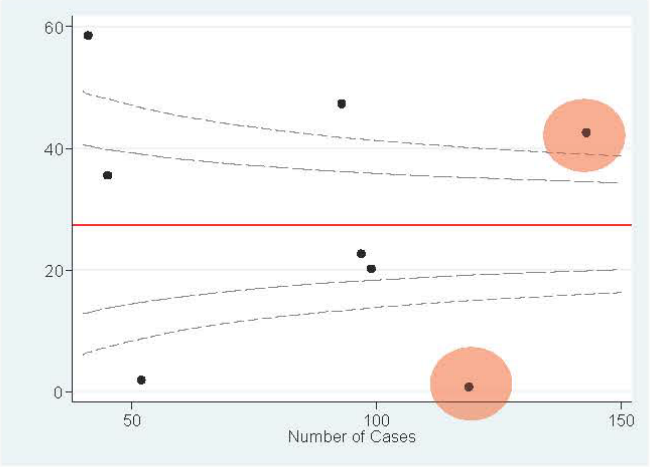
Source: Victorian Radiotherapy Minimum Data Set (VRMDS)

Supportive Care and Palliative Care

Process Results: Distress screening

QI 4: Number of patients with documented screening for supporting care.

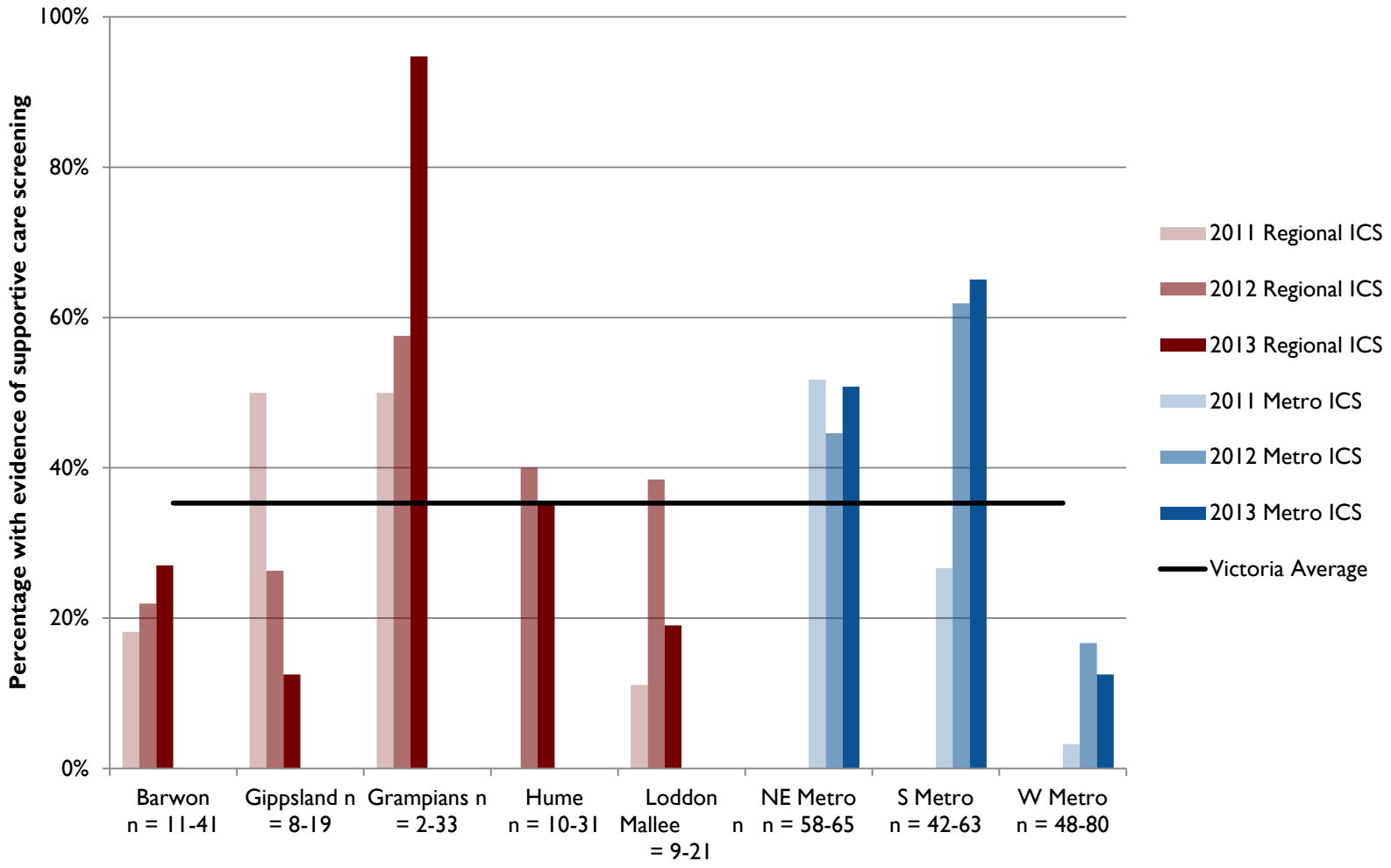
No.	Numerator	Denominator
4	Number of patients with documented screening for supporting care	Total number of patients in Registry



	A	B	C	D	E	F	G	H	TOTAL
Numerator	20	61	1	1	22	44	16	24	**189**
Denominator	99	143	119	52	97	93	45	41	**689**
%	20	43	1	2	23	47	36	59	**27**

Source: VLCR July 2012- June 2013

Supportive care needs screening

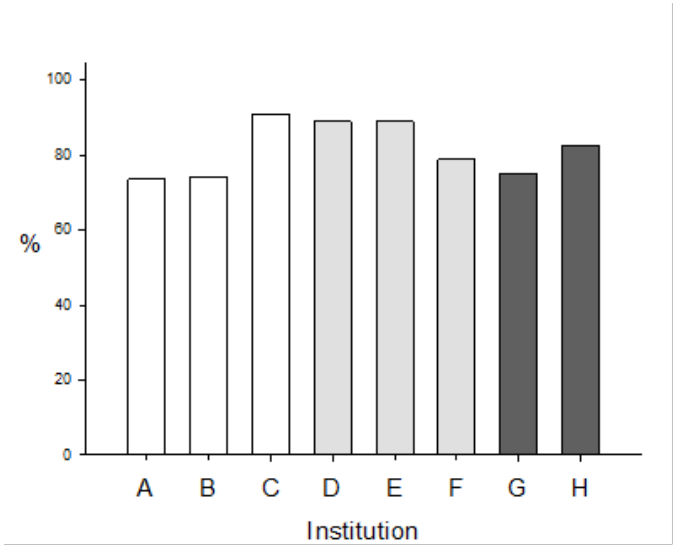


Source: DH audit
Sampling from VCR

Process Results: Palliative care access

QI 22: Percentage of patients with stage IV NSCLC referred to palliative care, where time between date of diagnosis and date of referral is less than or equal to 56 days.

No.	Numerator	Denominator
22	Number of patients with stage IV NSCLC referred to palliative care, where time between date of diagnosis and date of referral is than or equal to 56 days	Number of patients with stage IV NSCLC



	A	B	C	D	E	F	G	H	TOTAL
Numerator	25	23	39	8	24	15	15	14	**163.0**
Denominator	34	31	43	9	27	19	20	17	**200.0**
%	74	74	91	89	89	79	75	82	**82**

Source: VLCR July 2012- June 2013

Conclusions

- Lung cancer survival trending upwards
- Significant variation in 5 year survival regional vs metro
- Some difference in the likelihood of receiving a tissue diagnosis across ICS
- Some data suggests timeliness of diagnosis and treatment is an issue
- Low volumes of major lung surgery in a number of health services

Conclusions cont.

- Lung MDM case discussions could improve – 63% for the state
- There is variation in rates of adjuvant chemo across ICS
- Overall under-utilisation of radiation therapy
- Low and variable uptake of formalised supportive care screening

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